

A REVISION OF THE GENUS EPHUTA (MUTIL- LIDAE) IN AMERICA NORTH OF MEXICO

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PART II. SPECIES GROUP GRISEA¹

A considerable delay in the publication of this second section of the paper is partially due to difficulties experienced in the study of the Floridian populations of some species. Long series of several species, without adequate labels, were submitted in February, 1951 by a Floridian collector; these were all returned early in July, 1951, with a request that females, labelled as allotypes, be inserted in the collection of the U. S. National Museum, or another public museum. To date, these have not been so inserted, and data from them are not available for publication, thus imposing certain limitations on the description of these females, and in the matter of giving exact locality data of the allotypes.

References to figures in this section (and the forthcoming final section) refer to the figures in Plates I-V, pp. 35-43, in Part I of this publication. In addition to the help acknowledged in Part I of this paper, I would like to especially acknowledge the aid and encouragement received from my friend and colleague, Karl V. Krombein, in the completion of the final revision of the present text.

Since the publication of Part I of this Revision (Schuster, 1951), a very considerable additional body of material has become available for study, almost all collected during the last five years, in large part by Karl V. Krombein. The astute collecting of the latter has led to the association of several other females (*E. battlei battlei*, *E. sabaliana sabaliana*) with their respective males, necessitating an emended key to the *E. scrupea-pauxilla* complex of females, i.e., to those females without an evident micro-vestiture of the head, and without any trace of discal maculae of the second tergite of the abdomen. These are the females, of

¹ The first part of this revision appeared in this journal (Volume LIX, March 1951, pages 1-43).

course, which had been lumped in preceding treatments as "*E. puteola*." This emended key to the *E. puteola*-type females follows at the close of the final part of this Revision.

In addition to the undescribed females previously mentioned, a third undescribed taxon has been found, in the male sex, which is so wholly deviant in the structure of the head that it cannot be placed within the genus *Ephuta* s. str. as diagnosed and discussed in the preceding section of this revision. For this wholly anomalous species, it is necessary to erect a new subgenus, which may prove worthy of generic segregation if the as yet unknown female should possess sufficiently striking characters. A key separating the two subgenera recognizable in the North American fauna follows:

KEY TO SUBGENERA (MALES)²

1. Mandibles simply falcate, their tips not strongly deflexed, ventrally with the contours smooth, not emarginate nor dentate; dorsal margins of mandibles not produced as a lamellate prominent tooth; clypeus convex, with two usually divergent carinae running down from a common origin below and between the antennal tubercles (rarely fused to form a common median carina), diverging below to delimit an obtrapezoidal "clypeal basin"; lateral faces of pronotum not armed with a tooth below. Subgenus *Ephuta*³

1. Mandibles contorted, their distal halves sharply deflexed, the ventral margins interrupted and with a small subtending tooth; dorsal margins of mandibles expanded, before the middle, into a prominent lamellate expansion; clypeus strongly depressed, forming a basin with the closed mandibles, without carinae, but with a sharp finger-like process at its juncture with frons; lateral faces of pronotum armed with a small tooth near base of coxae. Subgenus **Xenochile** subg. n.

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MALE. Wholly black, with aspect of subgenus *Ephuta*, the petiole narrow and subparallel, hardly longer than broad; terga 3-6 of gaster longitudinally carinate along midline. Head transversely rectangulate, almost subquadrate, in dorsal aspect, rather full in temples, with close to contiguous, but rather fine puncturation. Genae evenly rounded into postgenal regions, neither region armed. Ocelli very small, their length ca. 0.2 the ocellular distance. Clypeus strongly depressed, forming a distinct basin with the monstrous, contorted mandibles, nearly flat, without carinae but with a sharp, finger-like median process at juncture with frons, which is produced down over the clypeal basin as a prominent, finger-like tooth. Mandibles

² The female sex of *Xenochile* is unknown.

³ See key to species on p. 24 of Part I of this revision.

strongly dilated, the distal halves strongly and sharply, angularly deflexed, obliquely bidentate apically, the ventral contours highly irregular, the ventral margin with a small but sharp, angular tooth beyond the middle, situated proximal of a slight but distinct notch; dilated dorsal margins of mandibles produced as a prominent, erect, lamellate and rounded tooth or expansion, situated well before the middle of the mandibles.

Alitrunk as in typical *Ephuta*, except for the flat lateral faces of the pronotum, which are produced at their lower corners as a distinct tooth. Gaster wholly identical in form with that of typical *Ephuta*.

Genotype:—*Ephuta* (*Xenochile*) *krombeini* sp. n.; the subgenus is monotypic.

Ephuta (*Xenochile*) *krombeini* represents a wholly deviant type in the genus *Ephuta*. It differs at once from all the nearctic and neotropical species of the genus known to me in the extraordinary, wholly anomalous mandibles, whose proximal and distal halves lie at a distinct angle to each other, and whose ventral and dorsal margins are both armed with teeth or angulations. Equally distinctive is the flat clypeus, wholly lacking the "usual" divergent carinae, but provided instead with a ligulate prominent process, projecting down over the depressed clypeal disk, originating just below the juncture of clypeus and frons. In spite of the distinctive and very large mandibles, and associated expansion of the head capsule and malar space, the single known species of *Xenochile* agrees very closely with the subgenus *Ephuta* in the form of the alitrunk and gaster. Only the slight armature of the lower angles of the pronotum represents a valid differentiating feature from *Ephuta* s. str. Should the female sex show major features differentiating it from the normal *Ephuta* "type", it will probably prove desirable to elevate *Xenochile* to the rank of a full genus.

***Ephuta* (*Xenochile*) *krombeini* sp. n.⁴**

MALE. Length 7-9 mm. Integument wholly black, the rather sparse vestiture almost wholly silvery, except the upper part of front, the mesoscutum, and in part abdominal terga 4-7 with fuscous to black hairs and setae. Punctuation relatively fine (compared to other nearctic species of *Ephuta*), the head with front, vertex and genae nearly equally, closely to contiguously, but moderately punctured, bearing scattered, erect, long setae and a thin, decumbent vestiture of silvery hairs (except, in part, on upper front, where the vestiture is blackish).

Head transversely subquadrate, subparallel for some distance behind the

⁴ Named for my friend and colleague, Karl V. Krombein, through whose generosity I owe the opportunity to study this anomalous species.

rather weakly protuberant eyes and rather strongly and abruptly narrowed into the posterior face, 1.58 mm. wide. Eyes moderately convex, only slightly laterally projecting beyond head capsule, 0.68 mm. long; malar space long, 0.30 mm. to the posterior mandibular condyle; narrowest interocular frontal distance 0.76 mm. long. Ocellar triangle small, and ocelli small: ocellar length 0.13 mm.; ocellocular distance 0.45 mm.; interocellar distance 0.20 mm.; distance between posterior and anterior ocelli 0.16 mm. Clypeus and mandibles as in description of subgenus. Antennae with scape sharply bicarinate; pedicel elongate 0.15 × 0.11 mm. wide; first flagellar segment elongate, 0.21 mm. × 0.14 mm. wide distally; second and third flagellar segments equal, 0.17 × 0.14 mm. wide.

Alitrunk rather moderately sculptured. Pronotum dorsally with contiguoconfluent, setigerous punctures, partly obscured by rather thin vestiture of sericeous, decumbent silvery hairs; lateral faces of pronotum nearly flat, the anterodorsal angles hardly angulate, not produced (width at shoulders 1.24 mm.); lateral pronotal faces coarsely but obscurely punctate both above and below the obscure and low oblique carina that traverses each lateral pronotal face.

Tegulae rather translucent, convex but not tectate even at base, smooth and polished but with scattered, rather fine setigerous punctures except laterally. Mesoscutum with more or less shallow, irregularly spaced but largely close, rather coarser, setigerous punctures that are not obscured by vestiture. Mesopleura convex, almost uniformly and almost throughout with close to contiguous, rather small, setigerous punctures, partly obscured by a rather thin vestiture of decumbent, sericeous, silvery hairs, only the posterior margin of mesopleura narrowly impunctate and virtually glabrous. Metapleura smooth and impunctate, except for the area above the coxae, which bears rather few but contiguous, shallow, coarse setigerous punctures verging on close-meshed areolations. Propodeum with dorsal and posterior faces evenly and gradually declivous into each other, with moderately coarse, rather shallow polygonal areolations, which become narrower and smaller anteriorly and along the slope into the lateral propodeal faces; without any distinct transverse ridge marking the boundary between dorsal and posterior propodeal faces; lateral propodeal faces smooth and nitid anteriorly, posteriorly with coarse and shallow punctures grading into areolations, which stop abruptly along a crenulate line anteriorly. Legs black, the posterior coxae unarmed; anterior coxae nearly glabrous, highly polished.

Gaster without distinctive features, except for petiole, wholly black. Petiole unusually elongate for the North American species of the genus: 0.58 mm. long × 0.44 mm. wide at anterior shoulders, 0.51 mm. wide at posterior margin, with the usual apical band of sericeous, silvery hairs; ventral carina sharp throughout, hardly produced anteriorly (but slightly higher both anteriorly and posteriorly than at middle). Tergum two on disk with relatively fine and well-separated setigerous punctures, bearing rather short, fuscous to black setae; lateral margins of tergum with even

finer, but closer, yet not contiguo-confluent puncturation. Terga 3-7 with median longitudinal carinae. Hypopygium buff-colored.

Type:—Ramsey Canyon, Huachuca Mts., Arizona, July 12, 1955 (G. Butler and F. Werner), on *Melilotus alba*; in collection of United States National Museum.

Ephuta (Xenochile) krombeini is the most strongly isolated of the North American species of the genus. It differs not only in the wholly deviant form of the mandibles and clypeus, but also has much more elongated flagellar segments, and a more elongate pedicel. The head is also much more strongly developed behind the eyes, and is almost subquadrate, as compared with the strongly transverse head shape of our other species of the genus. The subquadrate head shape is undoubtedly associated with the extremely heavy and cumbersome mandibles, which surely entail a heavier cephalic musculature. It is strongly reminiscent of a series of species of western Photopsidine (Sphaerophthalmine) Mutillidae.

Subgenus *Ephuta* Say

The discussion dealing with *Ephuta* Say in Part I of this Revision pertains wholly to the present subgenus, as does the diagnosis given therein. Of the three species groups known in the male sex (Groups *Grisea*, *Copano* and *Eurygnathus*), the first is dealt with in the remainder of this section.

Species Group GRISEA

Species in the males of which the subantennal carinae are dentiform produced about a half or more than a half their distance down to the anterior clypeal margin; the subantennal basin thus set off is higher than wide, often more like a gutter than a basin, and is about as high as the clypeal basin, or higher; a transverse carina between the dentiform processes is most often present, separating the two basins (Figs. 2-4, 6, 10, 14-23). The genae are moderately sculptured and rounded into the postgenal region. The sculpture is weak, rarely moderate; the vestiture is generally denser than in the group *Pauxilla*; the ridges running up from the antennal tubercles and out obliquely toward the eyes are entirely absent, and the frons is punctured right down to the scrobal carinae (Fig. 10); the transverse carina separating the propodeum into a dorsal and posterior face is

absent, or weakly developed, rarely moderate; sometimes it is reduced to a median tooth; the body is always black in color, with no tendency towards erythrization (with the exception of *E. floridana* and *rufisquamis*); the humeri are weak (except in *tegulicia*); and the mandibles are slender, evenly but strongly curved, acuminate, unidentate within (Fig. 10).

The relationship within the group of the various segregates is very difficult to ascertain at this point. Until the females have been correlated with the males, no opinion as to the interrelationships of the species, or of their status, can have more than a tentative validity.

Ephuta grisea Bradley

1899 *Mutilla scrupea* Fox, Trans. Amer. Ent. Soc., 25: 272, male (in part).

1916 *Ephuta grisea* Bradley, Trans. Amer. Ent. Soc., 42: 194 male (Montana, Colorado).

Holotype: Colorado, no other data, in collection of the American Entomological Society.

Distribution: Colorado (typical subspecies), and Alberta, Canada, Montana, Utah and North Dakota (subspecies *fuscosericea*).

This species, in its typical form, has the smallest ocelli of any of our North American species (see Table I). The type from Colorado is particularly notable in this regard. Other material seen from Montana, referred here, has the ocelli slightly larger. I believe that this material should probably be separated subspecifically from *grisea* proper, as typified by the holotype. A series of specimens, from North Dakota, and several specimens from Alberta, have been seen that agree with a series of individuals studied from Utah in having decidedly larger ocelli than the Colorado typical material of *grisea*. These specimens also differ in that there is a strong tendency for the subantennal carina to become obsolete dorsad of the median augulations (Figs. 14-15), thus leaving a subantennal platform, rather than a basin. Since these specimens have the ocelli so much larger, they are provisionally separated from typical *grisea* as the subspecies *fuscosericea*.

The species, as thus broadly defined, may be defined briefly as

follows: tegulae lacking coarse punctures, polished; humeri weakly produced, with the oblique extension of the humeral carinae that traverses the lateral faces of the pronotum obsolete, weak and rounded; ocelli small, the ocellocular distance 3.00–4.82 the ocellar length (see Table I); hypopygium fuscous to black; dorsum of head, mesonotum, and distal segment of gaster with inconspicuous fuscous hairs, as well as silvery hairs; transverse propodeal ridge virtually absent; subantennal carinae acutely diverging in straight lines, dentiform produced half way down towards the clypeal margin (Figs. 14–15, 21); wings distinctly subfuscous throughout; head never conically produced in the ocellar region.

As thus defined, the species is very closely related indeed to *Ephuta conchate* Mickel, which differs from it in the more strongly produced humeri of the prothorax, which have the carinae that obliquely cut the lateral prothoracic faces very sharp and acute.

The species as a whole is redescribed more fully under the description of *E. grisea* subspecies *fuscosericea* subsp. nova, below. Those characteristics and tendencies found in *fuscosericea*, but not in typical *grisea* are enclosed in parentheses.

The female sex is possibly *E. coloradella*.

Ephuta grisea subsp. *grisea* Bradley (Figs. 21, 42).

Ephuta grisea Bradley, Trans. Amer. Ent. Soc., 42: 194, male (in part, Colorado material only).

The typical subspecies of *grisea* has the ocelli smaller than in any other nearctic species of *Ephuta* (Table I). The present subspecies appears to represent a southern, perhaps montane race, of decidedly more limited distribution than the subspecies *fuscosericea*. It differs from the latter in that the ocellocular distance is nearly or quite five times as great as the ocellar length, and the interocellar distance is nearly or quite three times the ocellar length. Furthermore, the configuration of the subantennal ridges is different, with the subantennal ridges only slightly dentiform produced half-way from the base to apex (Fig. 21). The Montana material, cited as paratypic of *grisea*, I doubtfully place in the subspecies *fuscosericea*. In the size of its ocelli, as well as form of subantennal ridges, it appears to connect the southern

race (typical *grisea*) with the northern race (*fuscosericea*). Study of more complete series, especially from the area from Colorado north to Montana is necessary for a final differentiation between these two forms.

No material, other than the types, has been seen of typical *grisea*.

Ephuta grisea subsp. *fuscosericea* subsp. n. (Figs. 14-15, 42).

MALE. Length 15.5 mm. Similar to *grisea*, but the ocelli somewhat larger, their relative distance from the eye-margins less; (the subantennal carinae obsolete or weak above, strongly triangularly dentate about half way to the anterior clypeal margin, and there connected by a strong transverse carina), thus separating the subantennal basin, whose sides are subparallel below, from the clypeal basin that is delimited on the sides above by strongly diverging carinae that become obsolete before reaching the anterior clypeal margin (Figs. 14-15). Pubescence quite dense for *Ephuta*, that of the vertex, mesonotum and scutellum and apical tergite and sternite more or less strongly infuscated.

Head transversely oval-obtrapezoidal, the punctures moderate, but close to contiguous, foveate or nearly so; those of the genae somewhat larger, but scarcely obscured by the sericeous appressed silvery hairs; lower frons above antennal tubercules with dense decumbent tuft of silvery hairs; rest of frons chiefly with sparse erect silvery hairs; vertex with similar pubescence, but largely a deep fuscous. Ocelli small, but larger than in typical *grisea*, their maximum diameter 0.14 mm.; their distance apart 0.29 mm. (twice their diameter); their distance from the front ocellus 0.17 mm. (1.2 their diameter); their distance from the nearest eye-margins 0.51 mm. (3.6 their diameter); ocellar region slightly elevated. Pedicel equal in length to the first flagellar segment; second flagellar about one-fourth longer, scarcely longer than wide. Subantennal carinae as above; diverging at first, then subparallel (setting off a subantennal basin that is nearly twice as high as wide, and that is more or less obsolete above, because of the obsolescence of the carinae), produced as strong triangular teeth half-way to anterior clypeal margin, connected by a strong transverse carina, then diverging strongly, soon becoming obsolete, before reaching the rather moderately reflexed anterior clypeal margin.

Alitrunk entirely, moderately densely silvery pubescent, except for the mesonotum and scutellum, which are largely or entirely fuscous pubescent. Prothorax with the humeri weak, scarcely produced (0.82 as wide at humeri as head), evenly widened to tegulae (there 2.18 mm. wide; the width at humeri 0.71 the width at tegulae); dorsal face of pronotum rather evenly rounded into the cephalic face and into the lateral faces; the latter and the pronotum with rather coarse, close, at times contiguous punctures, the lateral faces with the punctures at times less close; the latter lacking any backward extension of the humeral carinae; the intervals between the punctures of the lateral faces micropunctate, bearing fine silvery appressed

hairs; the dorsal face with rather dense erect and decumbent silvery pubescence. Mesonotum with moderately small, scattered punctures, some contiguous, a few confluent, others well-separated, bearing sparse, decumbent and erect fuscous pubescence, except the lateral edges of the apical margin, which bear dense tufts of silvery fine hairs. Scutellum similarly punctured, nearly flat, weakly longitudinally sulcate medially in back; the pubescence long erect, fuscous and silvery mixed. Tegulae smooth, shining, except for a few coarse and some finer punctures bearing decumbent and erect silvery light fuscous pubescence; the basal half rather strongly folded, otherwise evenly convex. Mesopleura evenly convex, rather coarsely punctured, slightly more so than pronotum, closely so, moderately obscured by the decumbent and erect silvery pubescence. Metanotum raised medially, nearly evenly continuous with the scutellum, the raised portion coarsely punctate; the whole metanotum with fine, rather dense silvery hairs. Propodeum nearly glabrous, except at base, hexagonally to irregularly reticulate-areolate, the ridges sharp, high, medially delimiting an elongate large areole reaching back to the apex of the dorsal face; the less coarsely sculptured, mainly moderately punctured to smooth posterior face separated from the anterior by a rather weak, crenulate ridge; lateral propodeal faces rather coarsely punctured. Legs black, silvery pubescent. Wings evenly, moderately infuscated, the veins more so, the base of wing slightly less so.

Abdomen rather densely, closely punctured, with rather dense, shaggy pubescence. Petiole transverse, coarsely foveate above, with apical band of silvery hairs very weak; ventrally with median keel obsolete except anteriorly, where it is produced into a weak rounded tooth. Second tergite with the punctures close to contiguous, moderate, laterally less close; the intervals of the lateral areas with rather dense micropunctures bearing fine decumbent hairs (simulating the felt lines of other mutillids); apically with a dense band of curly, sericeous silvery pubescence; disk with sparse erect and decumbent silvery hairs. Apical tergites similarly pubescent, tergites three-five with (little), progressively less, sericeous pubescence similar to that of apex of second tergite. The sixth and seventh tergite with the long erect pubescence more or less strongly infuscated. Second sternite sparsely pubescent, with coarse punctures, less close but coarser than those of second tergite; apical sternites closely punctured apically, with sparse silvery pubescence, except for the more coarsely punctured hypopygium, whose apex is deep brown instead of black and bears all over strongly infuscated, long pubescence.

Holotype: Amalga, Utah, June 30, 1943 (C. J. Sorenson), from Sweet Clover (*Melilotus*) in collection of United States National Museum.

Paratopotypes: Five, some data, also in collection of United States Museum.

Paratypes: Beach, North Dakota, August 22, 1921, on flowers

of *Solidago* (C. N. Ainslie), ten males; Williston, North Dakota, July 24, 1920 (A. L. Olson), one male; Lethbridge, Alberta, Canada, June 28, 1914 (F. W. Sladen), two males, one lacking the abdomen; Manyberries, Alberta, August 11, 1939 (E. H. Strickland), one male.⁵

This subspecies is very closely related to subsp. *grisea*, but differs from it in the larger size of the ocelli (compare Table I), in the less amply developed vestiture (especially of the curly, sericeous hairs of abdominal tergites three and four), and in the fact that the dorsal portions of the subantennal ridges are more or less obsolete, while the dentiform produced median tooth of each ridge is very well-developed. The rather noticeably developed fuscous vestiture of the type and paratopotypes gives the subspecies its name.

The paratype material of *grisea* from Montana perhaps should be included here, since all of the specimens of this material I have seen, as well as two other specimens measured (see Table I), from Montana, have the ocelli nearly approaching *fuscosericea* in size rather than typical *grisea*. Study of more adequate series, from more localities, must precede final decision on this matter.

In the larger ocelli, the more strongly developed infuscation of portions of the vestiture, *fuscosericea* is more or less intermediate between *argenteiceps* and typical *grisea*. The much more strongly developed fuscous vestiture of that species, and its very large eyes and ocelli certainly warrant specific separation of *argenteiceps*.

***Ephuta argenteiceps* sp. n. (Fig. 42)**

MALE. Length 8-8.5 mm. Integument totally black, except for the pale buff to pale castaneous hypopygium, which is paler (nearly ivory white) on basal half. Vestiture quite sparse, the pronotum, mesopleura and dorsum of propodeum with only very thin, relatively inconspicuous decumbent, griseous vestiture; the abdominal tergites 3-5 totally devoid of such griseous vestiture. Erect vestiture largely silvery, but vertex, second tergite (except apex), anterior part of scutellum and tergites 3-7, as well as hypopygium virtually or entirely fuscous pubescent. Mandibles normal, slender, appearing bidentate (middle tooth suppressed). Ocelli rather large. Subantennal carina forming a tall, very narrowly triangular (virtually subparallel) basin, about 1.25 as high as the narrowly obtapezoidal clypeal basin (which is separated from subantennal by a strong

⁵ Two other males, labelled simply "Montana" have been seen; these are apparently from the same lot as the two paratypes of *grisea* listed by Bradley. These specimens, as noted below, are somewhat intermediate between typical *grisea* and *fuscosericea*.

transverse ridge). Sculpture quite coarse (much coarser and more rugose than in *grisea*). Tegulae rather evenly convex, ridged obtusely on basal fourth, the disk (except for the hyaline flange) with ill-defined, rather coarse and shallow, scattered to locally close punctures (not smooth and polished throughout, as in *grisea*). Wings subhyaline basally, weakly fuscous distally.

Head transversely oval, rounded behind eyes, 1.78 mm. wide. Sculpture quite coarse, confluent to rugosely sculptured on front and vertex, and virtually equally coarsely sculptured on the genae; the latter scarcely separated, rather evenly rounded into postgenae. Clypeal region with very sparse, erect silvery vestiture; upper front and vertex with similar, but deeply fuscous vestiture (except just above the antennal tubercles, and at upper boundary of scrobes, where it is erect and decumbent, sparse and silvery); genae with sparse, sericeous, decumbent vestiture arising from scattered punctulations. Ocelli rather large, length 0.175 mm.; ocellular distance 0.38 mm. (2.17 times the ocellar length); the interocellar distance 0.22 mm. (1.26 times the ocellar length); distance from median ocellus 0.15 mm. (0.86 the ocellar length). Eyes large, impinging notably on front and narrowing it perceptibly; eye-length 0.80 mm.; minimum frontal distance apart of eyes 0.69 mm. (0.86 times the eye-length); malar distance (to apex of ventral mandibular condyle) 0.23 mm. (0.29 times the eye-length). Between and below the antennal tubercles the head is strongly produced outward and elevated, the elevation on each side sharply defined by subantennal carinae, which diverge shortly, then run virtually parallel to the subantennal angulations (which occur distinctly more than half way down to the clypeal border), thus delimiting a subantennal basin of narrow boat-shaped, longitudinal form, three times as high as wide; at the angulation of the subantennal carina there is a transverse, carinate elevation, separating the gutter-like subantennal basin from the narrowly trapezoidal clypeal basin (which is about three times as wide as subantennal at its lower border); the subantennal carinae from the subantennal angulations on diverge at about a 50–55 degree angle, and soon become obsolete, before reaching the anterior clypeal margin (which is rounded and produced medially, and rather strongly reflexed). The oblique, suprascrobal ridges are vestigial and do not extend far above the antennal tubercles; the scrobal oblique ridges are strong, and separated from the coarse sculpture of the vertex by a depressed, transverse narrow, smooth region at their upper edges. Antennae with scape normally, very strongly bicarinate; pedicel small, subglobose, 0.14 mm. long; first flagellar slightly transverse, shortly, truncate obconic, 0.15 mm. long, 0.16 mm. wide; second flagellar slightly shorter, if anything, equal in length to third flagellar.

Alitrunk black, the legs piceous black. Sculpture rather coarse; vestiture sparse, silvery, except for that of mesonotum and anterior part of scutellum, where it is fuscous; decumbent-sericeous hairs of pronotum and mesopleura and dorsal propodeal face very sparse, inconspicuous, not obscuring sculpture. Prothorax a short trapezoid, in dorsal profile, broadly rounded-emarginate posteriorly, the humeral angles very weakly developed, obtusely

angulate (width at humeri 1.37 mm.; width at tegulae 1.91 mm.); humeral carinae obscure, the posterior fork normally obliquely traversing the lateral pronotal faces virtually absent (the lateral pronotal faces thus nearly plane, except for the median shallow depression); lateral faces shallowly, very obscurely, weakly sculptured, nearly flat and bearing sparse, setigerous punctulations; dorsal pronotal face rather coarsely, contiguo-confluently punctured. Tegulae as described above, moderately hirsute, the hairs pale or partly weakly infuscated, 0.88 mm. long (0.94 the length of the pronotum from humeral angles to lateral apices, which is 0.94 mm.). Mesonotum with coarse, rather poorly defined, foveate punctures separated by variable, moderate to slight intervals; the posterior portion with obscure parapsidal furrows indicated by weak, shallow depressions; vestiture entirely fuscous, except for a little on postero-lateral corners. Mesopleura evenly convex, less coarsely, more regularly punctured than mesonotum, with round, separated contiguous punctures. Scutellum flatly swollen, hardly gibbous, coarsely, contiguously punctured (much more coarsely punctate than in *grisea*). Propodeum very coarsely areolate dorsally, the areoles sharply defined, few in number (coarser than in *grisea*), separated by a median arrow-head shaped, longitudinal glabrous area extending back to posterior margin of dorsal face, where it ends in an erect, rather moderate tuberculiform tooth (which, on each side, extends obliquely backward and lateral to form a gradually disappearing weak transverse ridge, obscurely separating the propodeum into a dorsal and posterior face); lateral propodeal faces with ill-defined, very coarse reticulations, separated by rounded, glabrous intervals (the reticulation much coarser than in *grisea*); lower part of metapleura with a few, similar but smaller reticules, separated by a glabrous, shallow, oblique gutter (running along the anterior propodeal margin), from the propodeal reticulation. Legs piceous black. Wings subhyaline basally, weakly infuscated distally (the veins darker, but scarcely contrastingly so).

Abdomen piceous to black. Petiole coarsely, deeply punctured dorsally, with narrow lamellate intervals; with the distal sericeous, white band of hairs quite thin; ventrally with a low carina that is weakly produced anteriorly. Second tergite rather coarsely, closely to contiguously punctured (considerably more so than in *grisea*), fuscous pubescent, except for lateral and distal narrow borders; the lateral edges with sparse erect, and some sparse, curled, sericeous hairs (the latter arising from scattered punctulations occurring on the narrow intervals); the distal margin with a moderate, rather narrow and thin sericeous band of similar, curled hairs. Second sternite more coarsely, less sharply punctured, with rounded, narrow intervals, each puncture bearing a single white hair; distal band of hairs very thin. Apical tergites with separated, distinct, moderately small punctures, each bearing an erect to sub-erect fuscous hair (no pale vestiture beyond apex of second tergite), the intervals obscurely longitudinally striolate; median carinules distinct on tergite 3-7, rather sharp on the pygidium, on which the puncturation and vestiture become denser. Sternites three to six with rather distinct punctures, rather coarser than on

tergites, each bearing a single, short hair (thus with very thin sternal pale fringes); hypopygium closely, contiguously, distinctly punctured, with shorter, stiff, suberect, fuscous hairs; distal half of hypopygium buff to castaneous, basal half a dirty yellow-white.

FEMALE. Length 5 mm. Totally ferruginous, the last four abdominal segments somewhat castaneous distally, darker in appearance. Head with front, vertex and genae very densely, conspicuously silvery white, erect and decumbent and appressed pubescent, the vestiture obscuring the sculpture. Alitrunk with fine, close, sharply defined punctures, with sparse, erect and setaceous, and decumbent, finer vestiture, mostly fuscous pigmented (except on pleura and propodeum, where it is white); propodeum lacking median and dorsolateral lines of pale sericeous hairs. Second tergite with regular, fine, sharp puncturation, as on head and alitrunk; disk with almost absent, vestigial indication of pale maculae (consisting of a few isolated sericeous hairs); distal tergites fuscous pubescent, with a median line of sparse, silvery, sericeous, decumbent hairs.

Head broadly transversely oval, inflated appearing; the vertex with close, deep, round, distinct punctures situated subcontiguously (as on alitrunk), with narrow intervals punctulate, bearing dense, brilliant silvery, decumbent and appressed, curled, short sericeous vestiture; front and genae similarly punctured, with similar, rather sparser vestiture; the sparse erect hairs (issuing from the coarser punctures) also white. Parahypostomal ridges sharp, elevated, oblique, ending in a distinct, moderate, scarcely spiniform tooth; length of ridges 0.26 mm.; distance between dentiform-spiniform tubercles 0.47 mm.; beyond the dentiform angulation, the genal-postgenal ridges become very swiftly obsolete and do not extend for any distance beyond the teeth. Supraclypeal ridge weakly arcuate, transverse, broad, not strongly elevated and downward produced, 6-dentate (the lateral teeth of the four normal teeth again slightly bidentate). Eyes silvery, strongly faceted, irregularly ovate, weakly convex (not protruding from head), 0.47 mm. long, 0.38 mm. wide; interocular frontal minimum distance apart 0.66 mm.; head width 1.11 mm. Pedicel 0.09 mm., subglobose; first flagellar truncated obconic, 0.10 mm. long and 0.11 mm. wide; second flagellar short-cylindrical, 0.09 mm. long, 0.14 mm. wide.

Alitrunk elliptical-obovoid, a little more narrowed posteriorly than anteriorly, 0.95 mm. wide, 1.37 mm. long; at the prothoracic spiracles 0.95 mm. wide, at propodeal spiracles 0.88 mm. wide (the latter situated on conical projections); distance between anterior and posterior spiracles 0.47 mm. Puncturation close, sharp, distinct, contiguous and subcontiguous, rounded-hexagonal, very regular; each puncture with either a long, setose, erect, stiff, fuscous hair, or a decumbent, fine, shorter, paler or white hair; pleura similarly punctured and pubescent, but vestiture all pale; propodeum similarly punctured, with vestiture also all pale; propleural region with sericeous, decumbent vestiture quite thin and sparse.

Abdomen with petiole very short, transverse, parallel-sided. Second tergite closely, uniformly, hexagonally-circularly punctured, if anything,

slightly more coarsely punctuated than on alitrunk (decidedly more coarsely so than in *baboquivari*); the disk with decumbent, rather short, fuscous vestiture (suberect and much longer in *baboquivari*); maculae of basal half of tergite virtually absent (represented by a few inconspicuous, sericeous, curled, pale hairs); distal sericeous, pale band well-developed, undulate, unequally wide, medially interrupted. Segments 3-6 erect fuscous pubescent dorsally (except along narrow lateral edges, where silvery pubescent), but along the midline segments 3-5 bear distinct, though sparse, decumbent, silvery, curly hairs. Pygidium with area distinctly defined by anteriorly diverging carinules that extend about one-third length of tergite, U-shaped, 0.10 mm. wide (0.15 the interocular distance); lateral portions of pygidial tergite with shallow, rather close punctures, irregularly scattered. Hypopygium with basal tubercles connected by sharp carina, distally entire, not quadridentate.

Holotype: Male, Poway, San Diego County, California, in collection of University of Minnesota.

Paratypes: Claremont, California (Baker), in collection of Cornell University; Stanford University, Stanford, California, Sept. 12, 1909, in collection of United States National Museum.

Allotype: Female, Santa Clara County, California (Harkins), in collection of Stanford University.

The above male and female are associated by elimination; since no other male, and no other female of the genus *Ephuta* are known to occur on the west coast, it is presumed that the above male and female represent the two sexes of one species. The fairly extensive collections that have been built up from California during the last forty years would probably have revealed the existence of other species, if these exist on the west coast.

This species, in the male sex, is very closely related to *grisea*, and especially to the subspecies *fuscosericea* of the latter complex. Since the genus appears to be largely an eastern and midcontinental group, it may be presumed that *argenticeps* is a far-western derivative of the *grisea* complex.

The much more extensive infuscation of the vestiture of the body, and the development of much larger ocelli and eyes (with corresponding decrease in ratio of the length of these organs to their distance from ocelli, and frontal distance apart, respectively) at once distinguish this species from other males of the *grisea* complex (see Table I). The completely fuscous vestiture of tergites 3-7, indeed, will separate the species from all other black nearctic forms.

Other characteristics that separate the male from related spe-

cies are the narrow, gutter-like subantennal basin, the much coarser sculpture of the head, mesonotum, scutellum, propodeum, and second tergite (compared with *grisea*), the less conspicuous pale vestiture. In the extremely poorly developed posterior, oblique fork of the humeral pronotal carina the present species closely resembles *grisea*.

In the female sex, the brilliant silvery, conspicuous vestiture of the head is absolutely characteristic. The only other species approaching *argenteiceps* in this regard is *albiceps*, from Texas. The relatively vestigial maculae of tergite two; the silvery (not ivory-white) vestiture of the head; the hypopygium not quadridentate; the smaller eyes (distance apart on front 1.4 the eye-length, instead of 1.0–1.2 the eye-length) will separate *argenteiceps* at once from *albiceps*. Structurally, the presence of a sharp transverse basal ridge of the hypopygium in *argenteiceps* at once separates that species from *albiceps*, which has the hypopygium unarmed.

The obsolescence of the hypostomal-postgenal ridges, shortly beyond the dentiform angulation, and the vestigial maculae of tergite two, as well as the rather fine, close puncturation of the dorsum are also characteristic (although the puncturation is distinctly coarser than in the allied *baboquivari*).

E. conchate female differs from that of *argenteiceps* in the less dense and less shaggy, dull golden, instead of gleaming, silvery vestiture of the head (as well as in the presence of basal tubercles of the hypopygium instead of a transverse carina).

Ephuta conchate Mickel (Figs. 16, 46).

1923 *Ephuta conchate* Mickel, 19th Rept. State Ent. Minn.: 111, male.

Holotype: Fort Snelling, Minnesota, July 27, 1922 (A. A. Nichol), in Collection of University of Minnesota, Type No. 131.

Distribution: Previously known only from the type. Reported herein from Nebraska, Minnesota, Iowa, Illinois, Michigan, and New York westward to South Dakota and Kansas (Fig. 46).

Specimens examined:

KANSAS: Riley Co., June (Marlatt), one male.

ILLINOIS: Four males, numbered 17077 (two), 19569, 17424, no other data.

NEBRASKA: Malcolm, June 1909 (C. R. Oertel), one male.

SOUTH DAKOTA: Brookings, July 30, 1928 (M. Fredericksen), two males.

IOWA: COUNTY No. 4, July 17, 1934 (H. E. Jaques), one male.

MICHIGAN: Muskegon County, August 2, 1944 (R. R. Dreisbach), one male.

NEW YORK: Breesport, Chemung County, July 5, 1937 (Harvey I. Scudder), feeding on honey-dew of *Myzus ribis* on currant, one male; Ithaca (no other data), on male.

This rare species appears to have a distribution limited largely to the Transition, with a slight extension into the Upper Austral and Canadian Zone. Its distribution is analogous to that of *Dasymutilla gibbosa (cariniceps)*.

As is at once evident from the key, this species is very closely related to *E. grisea* (especially to the subspecies *fuscosericea*), and the ocelli are of nearly the same size in *conchate* as in *grisea*. In *conchate* the humeri of the prothorax are more strongly produced (humeral width 0.85–0.90 the width of head, contrasted to 0.80–0.86 for *grisea*). Perhaps the most striking characteristic in which this species differs from the *grisea* complex is in the development of the humeral prothoracic carinae. In *conchate* the posterior fork of the humeral carinae (obliquely traversing the lateral pronotal faces, from the humeral upper corners, to the lower, posterior corners) is very sharp and high, dividing the lateral prothoracic faces into distinct anteroventral and posterodorsal faces. The anteroventral portion of the lateral prothoracic faces are strongly declivous into the propleura. In *grisea* (and related species, such as *cephalotes*, *argenteiceps*, *ecarinata*, etc.) the posterior fork of the humeral carinae is weak, and the posterodorsal and anteroventral portions defined are virtually on one plane.

The single atypical individual from Ithaca, New York (See Table I) may be found to represent an extreme, heterogonic individual, in which the specific characters of *conchate* are not developed to a recognizable degree.

The female sex of this species, judging from distribution and similarity to the female of the related species *argenteiceps*, is almost certainly the following undescribed female. This female has a distribution in the Upper Austral and Transition Zones, from New York to Illinois. No other male (that is not correlated

with a female) has a distribution approaching this circumscribed range. The presumptive female sex of *conchate* may be described as follows:

FEMALE. Length 5.2 mm. Ferruginous throughout, except for the slightly darker vertex and the brownish-testaceous legs. Head with a very sparse and conspicuous yellowish to golden sericeous vestiture dorsally (in addition to the suberect, sparse, fuscous hairs); hypostomal-postgenal carinules not complete. Disk of second tergite with minute sericeous maculae; pygidium defined, distinctly, finely granulose-punctate or granulose; hypopygium with basal tubercles obsolete, not connected by a discrete transverse ridge.

Head 1.32 mm. wide, seen from above rather full in temples, nearly transversely oval-rectangular, not suddenly narrowed behind eyes; eyes 0.53 mm. long and 0.41 mm. wide; front 0.79 mm. wide (1.49 the eye-length); malar distance 0.29 mm. (the eye-length 1.83 the malar distance). Integument ferruginous, the vertex deeper and somewhat piceous-red. Punctures of front, deep, rather coarse and close but not confluent, those of vertex oval, much less close, the intervals mostly nearly as great as punctures; intervals not nitid, but roughened and punctulate, bearing a sparse vestiture of decumbent to appressed sericeous, chiefly golden tinted pubescence; the gross punctures bearing decumbent and erect golden tinted to fuscous stiff vestiture; genae with moderate vestiture of sericeous appressed and erect silvery hairs. Hypostomal-postgenal carinules not complete, disappearing gradually above the low, triangular hypostomal teeth, and then reappearing near the margin of the occipital ridge; the genal sculpture and vestiture slightly extending on to the area mesad of the ridges, the rest of the postgenal area transversely striolate. Antennae dull rufo-testaceous, uniformly colored and not darker than head, with the flagellar segment short and transverse (as in *coloradella*).

Alitrunk obovate-elongate in shape, considerably more narrowed in back than in front, the length 1.65 mm.; width at prothoracic spiracular plates 1.04 mm.; width at apices of propodeal spiracles 1.00 mm.; distance between front and posterior spiracles 0.58 mm. Puncturation deep, rather foveate, contiguous; vestiture sparse, the lateral pronotal faces with sparse, off-white sericeous vestiture (lacking prominent silvery sericeous vestiture); propodeum sparsely whitish, sericeous pubescent. Legs concolorous with alitrunk, slightly more testaceous, unicolorous.

Abdomen with petiolar ventral carina high and sharp throughout, slightly higher anteriorly. Second tergite with disk with rather coarse, not very sharply defined and rather shallow, slightly separated punctures; basal half of disk with two faint, obsolete spots of golden sericeous hairs; apical band equally wide, of brilliant silvery sericeous hairs, interrupted by fuscous hairs medially; disk of tergite two and tergites 3-5 with fuscous, suberect to somewhat decumbent hairs; pygidial tergite silvery pubescent. Pygidial area distinct, laterally defined by two discrete carinules, rather wide (frontal width 4.5 the pygidial width), the apical half somewhat ob-

scurely roughened, finely granulose, the basal part gradually becoming smooth. Hypopygium coarsely rugose-punctate on apical half, near base of coarsely sculptured region with a pair of obscure lateral tubercles; the coarsely sculptured area of hypopygial disk separated by faint lateral ridges from the impunctate lateral areas; these ridges running backward and not distinctly dentiform produced near apex; hypopygium thus appearing non-dentate and truncate apically.

Allotype: Palos, Illinois (R. Gregg), September 6, 1936, in collection of author (to be deposited in collection of Cornell University).

Parallotype: Poughkeepsie, New York, August 30, 1936 (H. K. Townes), in collection of Karl V. Krombein.

This female will be confused superficially with the *puteola* complex. The head bears a thin vestiture of fine, sericeous, deep, golden to burnt golden or somewhat fuscous decumbent hairs on the front and vertex, arising from punctulations interspersed amidst the normal punctures; this vestiture is so thin, however, as to be easily overlooked. Unlike the *puteola* complex the disk of the second tergite bears a pair of small, quite inconspicuous maculae of sericeous yellowish or whitish hairs. Both of these characteristics can be easily overlooked, and lead to confusion with the distantly related members of the *puteola* complex.

The related members of the *albiceps* and *baboquivari* complexes are sometimes difficult to distinguish. Both *albiceps* and *auricapitis* differ at once in the dense sericeous pubescence of the head and the large, conspicuous maculae of the second tergite. The weak development of the hypopygial basal tubercles in *E. conchate* and in *coloradella*, and the absence of a transverse, strong ridge connecting them is diagnostic, and will serve to separate *conchate* and *coloradella* females from all other members of the *baboquivari* complex. (See Key, p. 71)

E. conchate and *coloradella* appear to find their closest relatives in the superficially similar *E. baboquivari* and *E. floridana dietrichi*. The distinctly larger eyes and finer sculpture of *baboquivari* at once eliminate that species from confusion with *conchate* and *coloradella*; it furthermore has the head brilliant golden-yellow pubescent. Confusion is therefore most likely with *E. floridana dietrichi*. *E. conchate* and *floridana dietrichi* and *coloradella* have the eyes similar in size; with the interocular distance from about 1.3–1.5 the eye length; all three have the

sericeous vestiture of the head quite thin, and not golden yellow. *E. floridana dietrichi*, however, can be separated from the other two by the total absence of maculae of tergite two and by the sharply transversely ridged basal portion of the hypopygium; the apex of the hypopygium is also sharply quadridentate, while it is very weakly quadridentate (and appears entire) in *conchate* and *coloradella*.

The hypostomal-postgenal carinules are rather distinctly oblique, dorsad of the hypostomal teeth, and gradually disappear dorsad and mesad of the hypostomal teeth. The upper parts of these carinules are distinct at their juncture with the occipital ridge; they are produced downward and slightly outward, and are margined externally by a shallow obscure groove, becoming gradually obsolete at a point near, but somewhat laterad of the oblique ridges going up from the hypostomal teeth. The upper and lower portions of the carinules margining the postgenae thus are slightly indicated, and are obsolete medially only, not completely meeting. This condition prevails also in *E. coloradella*. In *E. floridana* and its subspecies *dietrichi*, on the other hand, the carinules bounding the postgenae disappear very swiftly above the hypostomal teeth and the genae and postgenae are very broadly continuous. Although these two types differ among themselves, both of these groups do not have the carinules bounding the postgenae developed nearly as strongly as in *baboquivari* and *argenteiceps*. In *conchate* and *coloradella* the postgenal area is largely striolate; in *E. floridana* and its subspecies *dietrichi* it is smooth throughout almost all its area. All three of these species agree in the nearly concolorous pigmentation of the legs and of abdominal segments 3-6, the entire body being uniform in color; all three species, furthermore, have a coarse sculpture recalling that of *argenteiceps*, much coarser than that of *baboquivari*.

The differentiation between the female of *conchate* and *coloradella* is based on very slight grounds that may not justify the erection of species. *E. conchate* has the vestiture of front and vertex burnt golden or subfuscous pigmented; in *E. coloradella* it is pale and white throughout. Since *E. conchate* female (with its distribution from New York to Illinois) suggests *E. conchate* male as regards distribution, and since *E. coloradella* is reported

from a state from which only one other species, *E. grisea grisea* is reported, certain interesting possibilities suggest themselves. It has been stressed that *conchate* is only doubtfully specifically distinct from *grisea*; the females belonging to these two forms would be expected to be exceedingly similar. The morphological similarity of the females of *conchate* and *coloradella* suggests they may not be specifically distinct; their analogous distribution suggests that *coloradella* is the female of *grisea*. If this should prove true, it may therefore be found wise to separate *conchate* as a subspecies only.

Ephuta scrupea Say (Figs. 2-4, 26-30, 42)

- 1836 *Ephuta scrupea* Say, Journ. Boston Soc. Nat. Hist., 1: 297, male.
- 1871 *Mutilla scrupea* Blake, Trans. Amer. Ent. Soc., 3: 230, male (in part.)
- 1899 *Mutilla scrupea* Fox, Trans. Amer. Ent. Soc., 25: 272, male (not Say).
- 1899 *Ephuta scrupea* Ashmead, Journ. N. Y. Ent. Soc., 7: 57, male.
- 1903 *Mutilla scrupea* Melander, Trans. Amer. Ent. Soc., 29: 324, male. (not Say).
- 1903 *Rhoptromutilla scrupea* André, Gen. Ins. Fasc. 11: 45, male.
- 1909 *Ephuta scrupea* Say, Viereck, in Insects of New Jersey p. 665?
- 1916 *Ephuta scrupea* Rohwer, Hymenoptera Conn. p. 625, male. (not Say, entirely or in part *E. pauxilla* Bradley).
- 1916 *Ephuta scrupea* Bradley, Trans. Amer. Ent. Soc., 42: 196, male.
- 1938 *Ephuta scrupea* Bradley, Insects of North Carolina p. 438.
- 1943 *Ephuta scrupea* Fattig, Emory Univ. Bull., 1: 13.
- Type: Indiana (lost).

Plesiotype: Male, Washington, D. C., Aug. 6, 1948 (D. Shapiro), taken at same time and place as allotype female (in USNM).

Distribution: New Jersey, Pennsylvania, Maryland, Virginia, North Carolina, Georgia, Alabama, westward to Ohio, Michigan and Arkansas, and presumably Indiana.

This, next to *pauxilla*, is the most frequent species in collections. Since it occurs over such a widespread area, and is so fully represented, it was felt certain that the female was confused with that of *pauxilla* in collections. This suspicion has proved to be founded in fact.

It is quite uncertain, in the writer's opinion, whether the name *scrupea* Say should apply to this species or to *E. pauxilla* Bradley, or possibly to *E. conchate* Mkl. Bradley (1916, p. 196) states: "In deciding to which of these two species (i.e., *pauxilla* Bradley and *scrupea* Say of the present treatment) Say's name should apply, I was guided by his description of the propodeum, which would not seem to fit *pauxilla* so well as the other. The remainder of the description might apply to either." I have not been able to gather from Say's description of the propodeum of his *scrupea* whether *scrupea* sensu Bradley or *pauxilla* Bradley or *conchate* Mkl. was involved, and believe that a decision of which species to call *scrupea* cannot be derived from the geographical distribution of these three species. The range of *scrupea* includes the southernmost tip of Ohio, west to Arkansas, and the entire region eastward of that line. A single specimen from Michigan indicates that *scrupea* will probably be found in Indiana (the type state of the species), although no material is known from there. *E. pauxilla* Bradley has been found in the entire region from Maine to Minnesota, and Florida to Texas. It occurs in the neighboring states of Ohio and Illinois and Michigan. It is certain to be found to occur throughout all or most of Indiana. I therefore believe that *scrupea* Bradley (and *scrupea* in this paper) may have to be given a new name, and that *pauxilla* Bradley may prove the same as *scrupea* Say. I feel that a change in names at this point is unnecessary, unless definite proof is at hand, and therefore follow Bradley (1916) as regards the names of these two species.

The male of *E. scrupea*, in the pale hypopygium, coarsely sculptured tegulae, simple hind coxae, absence of dense vestiture of the dorsum of the propodeum, and moderate, dense sculpture of abdominal tergite two, closely resembles *pauxilla* Bradley. That similarity, however, appears to be entirely superficial. The form of the subantennal ridges, the absence of a distinct transverse propodeal carina, the much finer puncturation (especially of the

disk of abdominal tergum two), and the lack of distinct genal ridges, at once separate *scrupea* from *pauvilla*.

E. floridana sp. n., however, appears to be closely related to *scrupea*, differing chiefly (in the male sex) in the totally ferruginous color of the integument (except only the yellowish-white hypopygium). The tegulae, ocelli, sculpture and form of subantennal carinae appear identical in both species.

This is the only male of the genus occurring in North America that tends to have the pygidium, as well as the hypopygium of the male largely yellowish; this character, unfortunately, is not absolute. All individuals have at least a faint trace of infuscation of some of the hairs of the vertex and mesoscutum; in some individuals the degree of infuscation of the vestiture recalls *grisea* and *conchate*. The form of the tegulae and pale color of the hypopygium will separate the species from these two forms, which bear at best a distant relationship to *scrupea*.

The male of *E. scrupea* can always be easily separated from other black species, by the shape of the subantennal carinae, and the basins they delimit, the moderate size of the ocelli, the weak humeri, lack of a strong transverse propodeal carina, lack of a median tooth between the two faces of the propodeum, coarsely punctured and hirsute tegulae, and yellow hypopygium.

There is considerable variation in the shape of the subantennal carinae and the basins they delimit, as can be seen on referring to the figures on Plate I; the carinae may run down parallel to each other to the upper margin of the clypeal basin, or they may diverge at first and then converge to varying degrees, at times becoming approximate at the dorsal margin of the clypeal basin, thus setting off an oval subantennal basin; at times the dentiform processes at the end of the subantennal basin may be connected by a weak transverse ridge, at times by a strong carina, and often there may be no separation, the two basins being evenly declivous into another; there is also considerable variation in comparative heights of the two basins; the slightly dentiform processes may occur less than, more than, or exactly half way down to the anterior clypeal margin.

The female sex of this species has been universally confused with *E. puteola* (Blake). The species is identical in nearly all respects with *puteola*, and agrees with it in the essential meas-

urements of head, alitrunk, and gaster (see Table IV). It may be briefly described as follows:

FEMALE. Nearly entirely ferruginous, but becoming castaneous to piceous on last 4 abdominal segments, and the legs and antennae usually castaneous to fuscous. Head with vertex with sparse erect and suberect dusky hairs only, not hiding the punctures, the very narrow intervals between the punctures devoid of punctulations; eyes relatively small, the front 1.33-1.49 the eye-length; head width 1.68-1.71 the frontal distance between eyes; malar distance 0.58-0.64 the eye-length (measured from lower corners of eye to apex of the ventral mandibular condylar region). Genal-postgenal carinules running up from the hypostomal teeth complete, but delicate, the genae and postgenae not continuous at any point.

Alitrunk as in *puteola*; closely, contiguously punctured, the propodeum not at all trilineate.

Gaster with disk of tergum two very regularly, contiguously punctured with fine, nearly circular punctures. Second segment light to deep ferruginous, nearly or quite concolorous with alitrunk; segments 3-6 more deeply pigmented, tinged with castaneous or piceous. Pygidial area bare, nitid, laterally defined; hypopygium distinctly tuberculate near base on each side, the tubercles more or less connected by a transverse, welt-like ridge; apex of hypopygium varying from entire and subtruncate to slightly but distinctly quadridentate.

Allotype: Washington, D. C., August 6, 1948 (D. Shappirio), taken at the same time and place as the plesiotype male; in collection of U. S. National Museum.

The female of this species differs from the female of *puteola* essentially as follows: the genal-postgenal carinules are complete (incomplete in *puteola*); disk of abdominal tergum two with fine, regular, very close and contiguous punctures throughout; gaster with second segment usually ferruginous and concolorous with alitrunk, contrasted to the more deeply pigmented distal abdominal terga. The relatively fine and regular puncturation, otherwise, is much as in *puteola*: it is subequal on vertex, notum of alitrunk, and disk of tergum two (with that of vertex slightly less coarse).

Occasional females can be separated from *puteola* only with great difficulty, since the two species have the eye-size and head measurements the same, and have a very similar facies (leading to uniform confusion in the literature under the name "*puteola*"). In some individuals of *puteola* the genal-postgenal carinules are obsoletely indicated throughout, at best by an obscure, delicate groove bordering the postgenae rather than by a distinct

ridge. Such individuals may give rise to confusion, and the writer at one time felt that the disposition of such females was virtually impossible. However, there are rather obvious differences in puncturation between the two species: in *scrupea*, the second abdominal tergum has the punctures extremely regular and contiguous, relatively fine and almost circular; in *puteola*, the tergum has the discal puncturation much coarser, the individual punctures more discretely separated from each other, and more or less elongate; furthermore, *scrupea* females generally have the deeper pigmented distal abdominal segments contrasted to the paler ferruginous second segment, which is always concolorous with the alitrunk (in *puteola* there is a well developed, though scarcely universal tendency for the posterior and lateral edges, and often disk as well, of the second tergum to be tinged with piceous, and the entire gaster is very often uniformly piceous-tinged, contrasted to the dull ferruginous alitrunk). The pigmentation in these two females often varies in the same manner and shows approximately the same type of variation. In the individual from Sea Cliff, for instance, the head and gaster are mahogany reddish to reddish-piceous, and the alitrunk and second abdominal segment are ferruginous, and somewhat contrasted to the darker apical abdominal tergites. As in *puteola* such regional differences in intensity of pigmentation cannot be correlated with other characters, and hence there is no indication that taxonomically sufficiently distinct genotypes are before me to warrant separate names. The development of the basal hypopygial tubercles also varies; they are weak and scarcely connected in the individual from Chatsworth, New Jersey; they are well-developed but scarcely connected in the individual from Washington County, Pennsylvania; they are well-developed and connected by a distinct transverse welt or ridge in the individual labelled "Penna."

The female differs from other *puteola*-like forms (except *tentativa* and *minuta*) in the complete genal-postgenal carinules. The nitid, relatively broad pygidial area, as well as the much finer puncturation separate the species at once from *minuta*, and the much smaller eyes separate the species from *tentativa*.

The female is divisible into two groups, occurring largely through the same range, on the basis of the form of the apex of the hypopygium: in one group of individuals (form a) its apex

is retuse (thus slightly bidentate), and the lateral margins, just before the apex, bear a small tooth on each side (the hypopygium thus appears slightly quadridentate in outline apically); in the other form (b) the hypopygial apex is truncate and there are no discrete lateral tubercles. It may be possible that these two forms represent discrete genotypes, but possibly the forms may be due to age differences (the tubercles, conceivably, can wear away with age). Until more is known about this extremely difficultly perceptible character it seems unwise to assign names to these forms, especially since intermediate individuals appear to occur.

SPECIMENS EXAMINED:⁶

NEW YORK: Sea Cliff, one female (form b); Derby, Aug. 18, 1951 (K. V. Krombein), one female, slightly atypical). NEW JERSEY: Chatsworth, Burlington County, June 15, 1923 (J. C. Bradley), one female (form a); Freehold, August 23, 1947 (D. Shappirio), one male. (Also reported from "Camden Co. [Fox]; Clementon, VIII, 27 [Fk]," *vide* Viereck, in Smith, 1909, p. 665; these reports may also refer to either *spinifera* or *pauquilla*). PENNSYLVANIA: Washington Co. (G. A. Ehrmann), one female (form a); "Penna.," no other data, one female (form a); Enola, reared from cocoons of *Pseudagenia bombycina* (Kirk & Champlain), one male; Mt. Holly Springs, Sept. 1, 1918 (R. M. Fouts), one male. MARYLAND: Cabin John, Sept. 9, 1916 and Aug. 21, 1917 (R. M. Fouts), two males; Beltsville, Aug. 30, 1947 (D. Shappirio), two males; Cabin John, Sept. 10, 1947 (D. Shappirio), one male; Potomac, Sept. 19, 1947 (D. Shappirio), one male; Patuxent Refuge, Bowie, Sept. 3, 1947 (D. Shappirio), one male. DISTRICT OF COLUMBIA: Washington, two females; Washington, Aug. 16–Sept. 11, 1943 (M. Vogel), three females (form b); Washington, July 25, 1947 (D. Shappirio), one male; Washington, July 30, 1948 (D. Shappirio, a), one male; Washington, July 3, 1948 (D. Shappirio, b), one male; Washington, July 23, 1947 (D. Shappirio), two males; Washington, August 29, 1947 (D. Shappirio), two males; Washington, Aug. 30, 1947 (D. Shappirio), two females, one male; Washington, Sept. 5, 1947, one female, two males; Washington, Aug. 6, 1948 (D.

⁶ Most of the females examined have been labelled "Parallotype" in order that a series of widely distributed specimens of the female sex shall be available in various institutions.

Shappirio), two males; Washington, Sept. 1, 1947 (D. Shappirio), two males, one female; Washington, Sept. 3, 1947 (D.S.), one male; Washington, Oct. 25, 1944, one male; Washington, July 31, 1947 (D.S.) two males; Washington, July 24, 1947 (R. Boetticher), one male; July 26, 1948 (D.S.), one male; Aug. 2, 1948 (R. Boetticher), one male; July 18, 1947 (R. Boetticher), one male; Aug. 1, 1947 (R. Boetticher), one male; July 17, 1948 (R. Boetticher), one male, one female; Washington, Aug. 30, 1947, two females, one male; Washington, July 17, 1948 (R. Boetticher), one male, one female; Washington, July 15, 1947 (D.S.), one female; Washington, Sept. 4, 1947 (D.S.), one male, one female; Washington, Aug. 5, 1948 (D.S., c), one female; Washington, July 10, 1947 (R. Boetticher), one female; Washington, June 7, 1947 (D.S.), one female; Washington, Sept. 11, 1948 (D.S., a), one female; Washington, Sept. 12, 1948 (D.S., a), one female. VIRGINIA: Dyke, Sept. 2, 1948 (D. Shappirio) one female; Great Falls, July 22 (N. Banks), one female (labelled "*puteola*" Bradley); Falls Church, Aug. 22 (N. Banks), two females (labelled "*puteola*" by Bradley; taken on Tulip Tree honey-dew); Great Falls, Sept. 24 (N. Banks), one female; Falls Church, Aug. 11 (N. Banks), one female; Falls Church, Sept. 16 (N. Banks), two females, on Tulip Tree honey-dew (labelled "*puteola*" Bradley); Falls Church, Sept. 6 (Banks), one female (labelled "*puteola*" Bradley); Falls Church, April 24 (N. Banks), one female (labeled "*puteola*" Bradley); Great Falls, June 16 (N. Banks), one female; Falls Church, Sept. 5 (N. Banks), one female (labelled "*puteola*" Bradley); Great Falls, June 25 (N. Banks), one female (labelled "*puteola*" Bradley); Falls Church, Apr. 26 (N. Banks), one female; Falls Church, Sept. 15 (N. Banks), one female; Vienna, July 4, 1935 (K. V. Krombein), one female; Glencarlyn, May 10 (N. Banks), one female; Falls Church, Sept. 10 (N. Banks), one female; Rosslyn, Sept. 1, 1912 (H. L. Viereck), one male; Falls Church, July 2, 1913 (W. Middleton), one male; Falls Church, Sept. 11-14, 1915 (G. M. Greene), two males; Falls Church, August 2 and Sept. 13 (J. Bequaert), two males; Falls Church, August 24 (on honey-dew on *Liriodendron tulipifera*) (N. Banks), one male; Glencarlyn, July 26, one male; East Falls Church, July 8 and July 17, 1912 (W. Middleton), two males; Great Falls, Aug. 13 (N. Banks), two males; Falls Church (various times, N. Banks),

fifteen males; Short Hill, Hillsboro, Aug. 26, 1944 (J. C. Bridwell) one male; Dunn Loring, Aug. 28, 1949, on *Liriodendron tulipifera* (K. V. Krombein), one female; Dunn Loring, July 13 1947, July 4, 1950, July 16, 1950, Sept. 11, 1948, July 29, 1951, July 18, 1948, Aug. 4, 1951, Aug. 5, 1951, Aug. 28, 1949, Aug. 7, 1949, Aug. 6, 1949, July 30, 1949, July 24, 1949, Aug. 21, 1949, Aug. 11, 1951, Sept. 9, 1951, July 31, 1948 (K. V. Krombein), 19 males; Arlington, Aug. 22, 1951 (K. V. Krombein), one male; Great Falls, Sept. 15, 1948 (K. V. Krombein), one male. WEST VIRGINIA: Cheat Mountain, August 23, two males; Cacapon State Park, Aug. 11, 1953 (K. V. Krombein), two males; Lost R. State Park, Hardy Co., July 5, 1953 (K. V. Krombein), one female cited erroneously as *E. conchate* in Krombein, 1954. NORTH CAROLINA: Valley of the Black Mountains, August 5, 1906 (W. Beutenmueller), eight males; Kill Devil Hills, July 10, 13, 18, 1950 (K. V. Krombein), three females; Kill Devil Hills, July 1, 4, 16, 1950 (K. V. Krombein), three males; Raleigh, July 19, 1933, October 4, 1935, August 13, 1929, September 27, 1929 (C. S. Brimley), four males; Raleigh, September 14, 1943 (D. L. Wray), one male. SOUTH CAROLINA: Venus, Greenville Co., 1100 ft., September 22, 1934 (H. K. Townes), one male. GEORGIA: "Two males, collected at Atlanta, July 8, 1942, and July 28, 1942" (Fattig, 1941, p. 13); Clayton Co. (2000-3000 ft.), June 1909 (W. T. Davis), one female. ALABAMA: Coleta (H. H. Smith), four males. OHIO: Hocking County, August (C. H. Kennedy), one male. ARKANSAS: Summit of Rich Mountain, 2600 ft., August 1, 1905 (A. P. Morse), one male. MICHIGAN: Muskeegan County, August 7, 1944 (R. R. Dreisbach), one male.

The species has been bred from the bee, *Pseudagenia bombycina*. The males are found frequently on honey-dew.

Females assigned to *scrupea* (Say) are placed here on the basis of: a. collection of males and females at the same time and place, b. correspondence in distribution, and subequal local frequency of male and female, c. elimination of all other species that could be involved.⁷ The above correlation has been possible

⁷ The three species found around Washington, D. C. can also be easily correlated with the respective male sex on the basis of similarities in sculpture between the sexes. The male *E. scrupea* has the disk of tergum two finely punctured; the female here associated with it is also characterized by the very fine puncturation of the disk of tergum two. In contrast, both male and female sex of *E. spinifera* and *pauzilla* have relatively coarse puncturation of the disk of abdominal tergum two.

largely because of the mass collections made around Falls Church, Va., by Mr. Nathan Banks, and in Washington, D. C., by Mr. D. Shappirio. In addition to the allotype and plesiotype, males and females have been collected together several other times (with no other male or female of *Ephuta* collected at the same time and place); Washington, D. C., July 17, 1948 (R. Boetticher), one male, one female; Washington, D. C., August 30, 1947 (D. Shappirio), one male, two females; Washington, D. C., September 4, 1947 (D. Shappirio) one male, one female. The male and female or also both quite frequent in the region around Falls Church, Virginia.

Ephuta floridana sp. n.

The present species, as here circumscribed, differs essentially from the very closely related *E. scrupea* by (a) the ferruginous color of the male, with the sculpture coarser; (b) the presence of a much more discrete microscopic tomentum or vestiture of the head, arising from minute punctulations scattered among the sparser, coarser punctures, in the female; (c) the obviously incomplete genal-postgenal carinules in the female.

The female sex appears to be composed of genotypically different forms, which may even be found to represent the female sex of distinct species of males. For the present the following more conservative course is followed, since the relationships with *E. scrupea* are so close that further "splitting" will probably not be warranted.

Ephuta floridana subsp. *floridana* sp. et subsp. n. (Fig. 42)

MALE. Length 5.5-6.0 mm. Totally ferruginous red, except for the legs, antennae, basal portions of mandibles, and distal portions of tergites 3-7, which are a castaneous red to piceous-red, and the hypopygium, which is off-white. Subantennal ridges sharp, pyramidally dentiform produced about half-way their length down to anterior clypeal margin, moderately diverging from between and below the antennal tubercles; connected at points of angulation by a transverse, sharp, erect ridge (thus delimiting a rather small ovate, deep, pit-like subantennal basin, distinct from the obtapezoidal clypeal basin). Ocelli moderately small. Sculpture rather coarse (considerably more so than in *scrupea*), locally punctate reticulate. Tegulae non-carinate, but very coarsely, closely to contiguously punctured throughout, with sparse short hairs. Propodeum coarsely reticulate-areolate, with no sharp separation into dorsal and posterior faces (the transverse ridge virtually imperceptible, the dorsal and posterior faces rounded into each other angularly.)

Head ferruginous, the clypeal region lighter, the basal portions of mandibles and antennae darker, castaneous-red to piceous. Front and vertex with rather coarse, well-defined, contiguous to rugose puncturations; genae similarly, much more coarsely, more sharply and deeply sculptured, posteriorly the intervals forming a slight, irregular ridge separating the genae from postgenal regions. Vestiture very sparse, inconspicuous, virtually erect and suberect (no sericeous vestiture), on clypeus, lower front and genae silvery, on upper front and vertex fuscous. Eyes moderate in size, 0.57 mm. long, 0.44 mm. wide; minimum frontal distance apart 0.57 mm. (equal to eye-length; this ratio about equal to that occurring in *scrupea*). Ocelli 0.12 mm. long; ocellocular distance 0.34 mm. long (2.83 ocellar length): interocellar distance 0.16 mm. (1.33 times the ocellar length); distance from anterior ocellus 0.10 mm. (0.83 times the ocellar length). Subantennal carinae as described above, the subantennal basin ovate, rather short and nearly pit-like, deep, hemispherical-ovate; subantennal ridges gradually becoming obsolete below the angulations. Antennal tubercules with very slight, short, swiftly obsolete ridges indicated above; scape normally bicarinate; pedicel subglobose, 0.11 mm. long; the first flagellar segment 0.12 mm. long, 0.15 mm. wide; second flagellar segment 0.10 mm. long, 0.15 mm. wide. Head 1.28 mm. wide.

Alitrunk ferruginous, quite coarsely sculptured. Pronotum coarsely sculptured on disk, the punctures deep, contiguous, angular; dorsal face rounded into cephalic face; width at the moderately strongly produced humeri 1.10 mm. 1.39 mm. at tegulae, trapezoidal in dorsal outline, with the base of the trapezoid deeply, obtusely, angularly emarginated by the mesoscutum (the pronotal face strongly abbreviated medially); humeri moderately acute, the strong humeral carina with the oblique fork of the lateral faces dividing it into two obsoletely, shallowly, distally punctured areas bearing a thin sericeous, fine pile, arising from minute punctulations. Mesoscutum similarly sculptured as dorsal propodeal face (more coarsely so that vertex), with no trace of parapsidal furrows: vestiture ferruginous-fuscous; scutellum somewhat swollen, but not approaching gibbous, with close, but less coarse punctures. Mesopleura evenly convex, with regular, rounded, rather deep, punctures considerably more moderate in size than those of pronotum; vestiture very sparse, thin, mostly erect, white, neither obscuring punctulation nor color of integument. Central, elevated area of metanotum nearly continuous with scutellum, with one or two coarse punctures; lateral regions depressed, obscurely punctulate and with a thin, pale pile; metapleura polished and glabrous, except for a few coarse, rounded punctures below. Tegulae as described above; very coarsely punctured, more than normal for *scrupea*. Propodeum dorsally very coarsely areolate, the areoles devoid of all vestiture; basal areole ending in a median ridge that ends in the vestigial, obscure transverse propodeal ridge; dorsal and posterior propodeal faces not distinguished, rounded into each other, the obscure transverse ridge not medially dentiform produced (as in *scrupea*); lateral propodeal faces with posterior half with a row of moderately coarse, sharply defined areoles, the anterior half polished, forming a smooth gutter adjoining the metapleura. Legs piceous-red, with pale

calcars, coxae not dentate. Wings subhyaline, distally not notably infuscated, the veins darker, brown.

Gaster ferruginous, except distal portions of tergites 3-6, pygidium and median carinules piceous or castaneous. Petiole short, transverse, rectangular in outline; first tergite coarsely, contiguously, sharply, polygonally punctate into about three transverse rows, at apex with a thin fringe of sericeous, curly hairs; first sternite with a low median carina, slightly more amply produced anteriorly. Second tergite with central portion of disk with rather coarse, rounded-hexagonal, deep, contiguous punctures, each bearing a single, short, subdecumbent fuscous hair; distal part of tergite with rather smaller, close, punctures, at apex with a rather thin band of white, sericeous, curled hairs (as in *scrupea*). Second sternite very coarsely punctured, the punctures contiguous, the narrow intervals rounded at apex, very sparsely silvery pubescent. Tergites 3-6 with rather distant, small punctures, with erect and subdecumbent fuscous, sparse vestiture (no sericeous decumbent vestiture); pygidium with similar, slightly coarser, contiguous punctures and erect and decumbent sericeous, curled, moderately dense, pale vestiture. Hypopygium whitish, at the very apex slightly brownish or buff, with obscurely defined, rather close, moderately coarse punctures.

FEMALE: Appearing intermediate in form between *E. scrupea* and *E. floridana* subsp. *dietrichi* (see below). The head with a discrete delicate, microscopic tomentum of fine fuscous hairs (so inconspicuous that the species has the facies of *E. puteola*); disk of tergum two of abdomen not bimaculate, the distal band subequally wide, except for the median interruption; genal-postgenal carinules incomplete, extending only a slight distance up from the teeth peripheral to the hypostomal area, the genae and postgenae thus broadly confluent, evenly continuous; hypopygial basal tubercules connected by a rather discrete transverse, welt-like ridge.

Holotype: Male, Pasco Co., Nov. 13, 1929 (O. C. Tigner), in collection of U. S. National Museum. Paratype: "Florida" in collection of Univ. of Minnesota (the measurements in diagnosis from paratype); the paratype is unfortunately in poor condition of preservation; the right eye, the distal portions of antennae and parts of the legs having been eaten away by dermestids, and the apical portions of the wings missing. A third male, Gainesville, Florida (F. W. Mead), taken on *Medicago sativa*, is in the U. S. National Museum.

Allotype: Florida, no other data supplied by the collector (D. Downes); to be deposited in collections of United States National Museum (fide Downes).⁸

⁸ The above brief description is totally unsatisfactory. A better one cannot be given because the collector, who submitted a large series of specimens of both sexes, without locality data, which the author returned after verification, with the request that the material be labelled with labels other than meaningless code-tags. The material has not been made available again, and the above brief diagnosis is the only one made before the return of the allotype specimens. The long series of males and females present in the Downes collection made correlation of the male and female readily possible.

This species is the Florida analog of the *scrupea-argenteiceps* complex, and is obviously related to *E. scrupea*. In the male sex it shares with the latter species all of its main species characteristics: whitish hypopygium, ocelli of moderate size, form of sub-antennal ridges and the basins they delimit, eye-form and size, and the relative length of eye to the frontal distance apart; moderate degree of development of humeral ridges; form of propodeum (with lack of a sharp differentiation into an areolate dorsal and smooth posterior face). Aside from the obvious color differences between the two species, one may mention the following structural differences: the head, dorsum of pronotum, and propodeum, as well as second tergite, are much more coarsely sculptured; the lateral pronotal faces are much more weakly and shallowly punctured, indeed, virtually impunctate (in *scrupea* rather deeply and distinctly punctured virtually throughout); the scutellum is rather more distinctly swollen; the disk of the second tergite is contiguously punctured (rather than moderately closely so). These structural characters indicate that *floridana* is certainly specifically distinct from *scrupea*.

The female sex (which is correlated almost certainly with the right male), is nearly transitional between the *Grisea* and *Puteola* complex of females. It shares, with these two complexes, the obviously incomplete carinules that lie between the genae and postgenae (above the hypostomal teeth), resulting in broadly confluent genae and postgenae. This characteristic at once will separate the female from that of *E. scrupea* (in which the carinules are complete). However, in other characters, the female closely approaches that of *E. scrupea*, notably in the lack of discal maculae, in the very slight development of the microsetigerous punctulations and vestiture of the dorsum of the head, and especially in the relatively small, very close to contiguo-confluent punctures of the disk of tergum two of the abdomen. If the correlation of these females to *E. floridana* and *scrupea*, respectively, will be substantiated (as is expected), the differences between the females will indicate beyond any doubt, that there are two distinct species, even though the males differ in largely pigmentational characters.

The extremely slightly developed microsetigerous hairs of the front and vertex of this subspecies will make its identification difficult. In "rubbed" specimens, the presence of these hairs

can be seen largely because the intervals between the coarser punctures are not highly polished, but somewhat roughened and dull, marking the points of origin of the microvestiture. Occasional females of *E. scrupea* almost approach the "baldest" individuals seen of *E. floridana floridana*.

The female sex of this subspecies looks superficially like "*E. puteola*," e.g., the disk of tergum two is immaculate, and the head is superficially devoid of sericeous vestiture. Under the higher powers of the wide field binocular microscope, however, the head shows a distinct (if thin) microsetigerous vestiture, and obscure micropunctulations, arising in part from the narrow intervals between the coarser macrosetigerous punctures. The decumbent microsetigerous, more or less sericeous hairs are griseous-fuscous to fuscous (and therefore extremely inconspicuous, since they almost blend with the integumentary color of the head). In this respect, the subspecies looks very much like *E. conchate* and *E. coloradella* females. It differs from these immediately in the uniform absence of the small maculae of the disk of abdominal tergite two, in the fact that the hypopygial tubercles are more or less connected by a transverse welt-like ridge, in the largely pale pubescence of abdominal tergites 4-5, and in minor differences in puncturation. A further difference may lie in the head shape: in *floridana* it is apparently uniformly strongly convergent behind the eyes, hence the head (behind the eyes) looks almost broadly triangular, or narrowly obtrapezoidal; in the few individuals seen of *E. conchate* females, the head is slightly convergent behind the eyes and more gradually rounded into the broadly truncate posterior aspect: hence, the head behind the eyes is more obtrapezoidal-rectangulate. This difference, although real, can be appreciated only when individuals of both species can be compared side-by-side.

Although the males of *E. floridana* and *scrupea* appear to be closely similar, the females exhibit a relatively distant relationship. The female of *E. floridana* differs from that of *scrupea* as follows: 1) the head is provided with a decumbent sericeous vestiture, 2) the head has the genal-postgenal carinules quite obsolete above the hypostomal ridges and teeth.

The female *E. floridana floridana* is almost identical with that of *E. floridana dietrichi*, from Alabama and Mississippi, differing from the latter in that the microsetigerous, sericeous

vestiture of the head is less obvious, very fine, and more or less fuscous (never golden yellow). Whether these differences will prove to be subspecific is problematical. The more brilliant vestiture of the head of *E. dietrichi* gives it a facies (under even relatively low powers) unlike that of the old "*E. puteola*." On the other hand, the very obscure sericeous vestiture (together with the fact that it is so dark that it blends with the pigmentation of the head capsule), gives *E. floridana* females a facies very similar to that of *E. puteola* (in its classical sense).

In Florida, *E. floridana* and *slossonae* appear to occur together very frequently (see notes under *E. slossonae*), and are not easily separated at times; both share the incomplete genal-postgenal carinules, a *puteola*-like facies, and similar pigmentation. *E. floridana* differs from the latter (and from *E. tentativa*) in that the head has a sparse, easily overlooked sericeous vestiture on the front, vertex and occiput. The females of the species known from Georgia and Florida (except for *E. margueritae*, which lacks a pygidial area) can best be contrasted in the subjoined key:

1. Genal-postgenal carinules complete; head totally devoid of sericeous vestiture of the upper front and vertex (with sparse, erect hairs only).
..... *E. tentativa*
1. Genal-postgenal carinules obsolete, the genae and postgenae confluent without trace of interruption, continuous 2.
2. Head with very sparse, inconspicuous, but distinct sericeous vestiture (in addition to sparse longer erect hairs) on the front and vertex, the macropuncture intervals dull, not smooth; disk of tergum two with round-hexagonal, regular, contiguo-confluent, smaller, very regular and close puncturation *E. floridana*
2. Head without any sericeous vestiture, the puncture-intervals of front and vertex polished; disk of abdominal tergum two with coarser, shallower, ill-defined punctures, mostly with obvious intervals (except at base) 3.
3. Eyes large: the front between the eyes 1.17-1.21 the eye-length; eye length 1.9-2.1 the malar distance; head obtrapezoidal, strongly and swiftly narrowed behind the protuberant eyes; abdominal tergites 4-5 silvery pubescent; front and vertex with round punctures, widely separated, the flat intervals polished, the head thus nitid.
E. slossonae and *battlei*⁹
3. Eyes smaller: the front between the eyes 1.22-1.65 the eye-length: eye-length 1.3-1.9 the malar distance; head not obtrapezoidal, gradually

⁹ As will be brought out under *E. battlei*, the female sex is hardly separable with any certainty from that of *E. slossonae*.

narrowed behind the eyes, which appear less protuberant; front and vertex with close, contiguous to contiguo-confluent, angular punctures, the intervals narrow to obsolete. 4.

4. Antennae reddish on scape, blackish only distally; legs concolorous with alitrunk proximad of apices of femora, fuscous to blackish distally only; terga 3-6 of abdomen with integument castaneous to fuscous and tergite 2 more or less castaneous to fuscous (at least laterally and distally); head often piceous; front 1.30-1.65 the eye-length. *E. puteola*¹⁰
4. Antennae uniformly blackish, including scape, strongly contrasted to the always ferruginous head; legs wholly blackish, except for coxae and trochanters; terga 2-6 of abdomen with integument wholly ferruginous, like that of alitrunk and head; front 1.22-1.37 the eye-length.

E. sabaliana

***Ephuta floridana dietrichi* sp. et subsp. n.**

FEMALE. Length. 5.2 mm. Similar in general appearance to *puteola*, but with the entire body ferruginous, the head with the vertex concolorous, the legs and distal abdominal segments all uniformly pigmented, and with the head with a distinct, decumbent to appressed sericeous yellowish tinged vestiture that slightly obscures the sculpture; hypostomal-postgenal carinules disappearing shortly above the hypostomal teeth. Disk of tergite two not maculate; pygidium defined, smooth and nitid; hypopygium with the basal tubercules distinct, connected by a discrete transverse ridge, the apical part of the hypopygium distinctly quadridentate.

Head transversely oval, not conspicuously narrowed behind eyes (hence not obtapezoidal in outline), 1.26 mm. wide; eyes moderately large, silvery, 0.54 mm. long and 0.40 mm. wide; front 0.72 mm. wide (1.32 the eye-length); malar distance 0.31 mm. (eye-length 1.74 the malar distance). Integument ferruginous, concolorous with rest of body; sculpture moderate, the punctures of the front slightly but distinctly separated, scarcely contiguous, those of vertex even more distinctly separated, the intervals roughened and punctulate; coarse punctures setigerous, giving rise to burnt golden, suberect, stiff, moderately long hairs, the interspersed punctulations giving rise to a moderately dense, sericeous vestiture, pale yellowish on lower front and posterior part of vertex, but somewhat fuscous-tinged on lower vertex; occiput and genae similarly, slightly more deeply punctured and with a rather distinct whitish sericeous vestiture. Hypostomal-subgenal carinules very incomplete; high and lamelliform in the lower, oral portions, from the condylar region to the spines, but obsolete very shortly above the teeth, thus with the genal and postgenal regions evenly continuous for the greater part of their length; the postgenal region largely smooth and nitid, except anteriorly along midline, where the integument is weakly, transversely striolate. Antennae concolorous at base, somewhat fuscous on distal halves; pedicel transversely obconic, 0.10 mm. long and 0.12 mm. wide; first flagellar segment 0.13 mm. long and 0.16 mm. wide; second flagellar segment 0.11 mm. long and 0.18 mm. wide.

¹⁰ The putative female of *E. pauxilla*.

Alitrunk ovate-elliptical, slightly wider anteriorly than posteriorly, 1.72 mm. long, 0.92 mm. wide at prothoracic spiracular plates, 0.93 mm. wide at apices of propodeal spiracles, the distance between the front and posterior spiracles. 0.56 mm. Integument concolorous with head and gaster, ferruginous; sculpture moderately coarse (considerably more so than on head, the punctures more elongate and close to contiguo-confluent), more shallow and not as sharply defined. Vestiture of meso- and metanotum dusky, sparse, elsewhere silvery white; the pronotum, especially on the lateral faces, with rather dense and obvious off-white sericeous vestiture; propodeum silvery pubescent; lacking all trace of lines of sericeous hairs. Legs uniformly yellowish-ferruginous, nearly concolorous with body.

Gaster ferruginous throughout, the apical segments scarcely castaneous tinged, virtually concolorous. Petiole with carina high, scarcely higher anteriorly. Second tergite rather coarsely and contiguo-confluently punctured on disk (like notum of alitrunk), the punctures contiguo-confluent even laterally; disk with stiff, fuscous, sparse, setose pubescence and at apex with a dense, subequally wide band, of ivory-white sericeous decumbent to appressed hairs, distinctly interrupted medially by fuscous hairs; disk lacks all trace of sericeous discal maculae. Second sternite coarsely confluent to rugose-confluently punctured, with sparse whitish vestiture. Tergite three, except laterally, with burnt golden to fuscous vestiture; tergites 4-6 and sternites 3-6 with virtually entirely silvery-white vestiture. Pygidium with distinct lateral carinules defining a smooth and nitid area 0.16 mm. wide; area laterad of pygidial area with rather distinct contiguo-confluent setigerous puncturation. Hypopygium with basal tubercles distinct, connected by a discrete but low, rounded transverse ridge; region distad of basal ridge rather coarsely and closely setigerously punctured; apex distinctly quadridentate.

Holotype: Lucedale, Mississippi, April 13, 1932 (Henry Dietrich), in collection of Cornell University.

This subspecies (and the variant of it described below) agree in most respects with *E. baboquivari* in the relatively dense, slightly yellowish sericeous vestiture of the head, obscuring the sculpture; the absence of all trace of maculae of tergite two; the connected hypopygial teeth; the nitid, defined pygidial area. *E. floridana dietrichi*, however, differs from *baboquivari*, in the somewhat smaller eyes and wider front, the incomplete hypostomal-postgenal carinae, the much coarser, less sharply defined punctures (on disk of the second tergite the punctures are about 0.07 mm. wide in *dietrichi*; in *baboquivari* only about 0.04 mm.).

Structurally, the species agrees more with *E. conchate* and *coloradella*, from which it differs in the more completely continuous genal-postgenal region (with the hypostomal-postgenal carinules much less developed above the hypostomal teeth), the

smoother postgenal region, and the more completely developed basal hypopygial tubercles (and connecting ridge). *E. f. dietrichi* also has the sericeous vestiture of the head better developed, while it lacks the maculae of the second tergite (which are present in *E. conchate* and *coloradella*).

Related very closely to *E. floridana dietrichi* is the following form. Since I cannot demonstrate that the differences between the two are constant, I prefer to treat it, tentatively, as a minor variant to which no taxonomic rank is accorded:

Similar to typical *dietrichi*, but differing as follows: tergites 3-5 of abdomen largely fuscous pubescent, except for a median longitudinal line, obscurely defined, formed by decumbent to appressed, silvery, sericeous hairs; head more densely and uniformly pubescent, the sericeous hairs all ivory white to very pale yellowish, the erect hairs all uniformly golden in color; hypostomal-subgenal ridges quite suddenly obsolete dorsad of the hypostomal teeth.

From Mobile, Alabama, August (Creighton), in collection of University of Minnesota.

This variant differs chiefly in the presence of a line of silvery sericeous hairs on the distal abdominal tergites. More material may bridge the gap between this and typical *dietrichi* and indicate nomenclatorial recognition of this extreme as unnecessary. The chief dimensions are in about the same ratio as in typical *dietrichi* (compare Table IV).

It needs to be pointed out that *E. floridana floridana* is at present known only from Central and Southern Florida. No male closely allied to that of *E. floridana floridana* is known from the Gulf Coast region of Mississippi and Alabama. As a consequence, the real possibility exists that the individuals here described as a subspecies of *E. floridana* (subsp. *dietrichi*) may represent a wholly discrete species.

***Ephuta tentativa* sp. n.**

FEMALE... Length 6 mm. Integument nearly uniformly ferruginous, except the flagellum of the antennae and the apical four segments of the abdomen slightly darker (the head and disk of second tergite light ferruginous). Entirely similar to *E. puteola*, but the eyes larger, more prominent, the front only 1.17-1.25 the eye-length.

Head 1.46 mm. wide, in dorsal profile transversely oval-rectangular, gradually narrowed behind eyes and not distinctly obtrapezoidal, punc-

ured and pubescent as in *scrupea* and *puteola*. Eyes 0.66 mm. long and 0.49 mm. wide; front 0.79 mm. wide between eyes (1.17 the eye-length); space between eyes and apex of posterior mandibular condyles (base of hypostomal carinules) 0.30 mm. (the eye-length 2.2 the malar space). Genal-postgenal carinules running up from the hypostomal carinules complete, sharp and even, but delicate, the smooth, nitid, impunctate postgenal region sharply separated from the contiguously punctured genae. Antennae as in *scrupea* and *puteola* as regards ratios between segments.

Alitrunk as in *scrupea* and *puteola*, with puncturation of dorsum slightly coarser than that of vertex, 1.19 mm. wide at anterior spiracles, 1.09 mm. wide at apices of the tubercle-like propodeal spiracles (the distance between the anterior and posterior spiracles 0.64 mm.); length of alitrunk 1.83 mm. Legs concolorous with alitrunk.

Gaster with distinct anterior petiolar tooth: second tergite with punctures no coarser than on alitrunk, contiguous to nearly confluent on central part of disk; apical pubescent band equally wide, dense, interrupted by darker vestiture medially. Tergites 3-5 more or less completely fuscous pubescent; tergite 6 whitish pubescent, 0.76 mm. wide at base; pygidial area discreet, small, smooth and nitid, 0.16 mm. wide (the last tergite about 4.8 as wide as pygidial area; the front also about 4.8 as wide). Hypopygium with prominent basal tubercles, not distinctly connected by any transverse ridge; apex very obscurely 4-dentate, the lateral teeth minute, the apex scarcely retuse.

Holotype: Atlanta, Georgia, June 2, 1935 (P. W. Fattig), in collection of University of Minnesota.

Paratype: Ochlochnee, Georgia, May 8, 1940 (P. W. Fattig), in collection of P. W. Fattig.

This new species is possibly the female sex of *E. psephenophila*, since it differs from *puteola* and *scrupea* in the larger eyes and correspondingly narrower front. The larger eyes of *E. psephenophila* and narrower front, it will be remembered, represent one of the significant characters separating that species from *scrupea*. Associated with larger eyes, there has been a corresponding decrease in size of the malar space (which for convenience is measured, in all the females) from the base of the hypostomal carinules, i.e., near the posterior mandibular condyles, to the lower eye-margin. The relatively sharply developed, complete carinules separating the genae from the postgenae also separate the species from *E. puteola* and *E. slossonae*. Confusion with either of these species is easily avoided, since *E. slossonae*, which has larger eyes as in *tentativa*, has virtually no indication of the genal and postgenal carinules and therefore has very broadly confluent genae and postgenae. In *puteola*, where there may be slightly indi-

cated obscure ridges, the eyes are much smaller than in *tentativa*. Confusion, therefore, is possible only with *scrupea*, from which *tentativa* differs only in the larger eyes. It is therefore possible that the latter should be considered merely a subspecies of the former, but the occurrence in the same general area of both forms suggests this is impossible.

This species agrees with *scrupea* (and *minuta*) in possessing very distinct, if low, complete postgenal carinules that extend up to the occipital transverse ridge. It differs from both of these species in the relatively large, silvery, prominent eyes (the front between them narrow, only 1.17–1.21 the eye-length; the malar distance, to apex of ventral mandibular condyle, narrow, only 0.4–0.45 the eye-length; the head 1.85 the width of the front).

The species is extremely close to *scrupea*, with which it agrees in sculpture, size, and pigmentation.

***Ephuta psephenophila* sp. n. (Fig. 18).¹¹**

MALE. Length 6.2 mm. Entirely black, with moderately abundant silvery pubescence; ocelli extraordinarily large; subantennal pit elongate, narrow, higher than the clypeal; humeral angles weakly developed; tegulae smooth, except for micropunctures; transverse propodeal carina distinct, but rather weak; sculpture moderate.

Head oval-obtrapezoidal, rather shallowly, not at all coarsely punctured with well-separated punctures that are somewhat obscured by the rather dense, silvery, erect and appressed pubescence (especially on the lower front); punctures coarser, but well-separated, on the occiput, genae and postgenal region; the latter not subreticulate and carinate; width of the head 1.56 mm. (1.26 the width of the prothorax at the humeri). Width between the eyes, below their emargination 0.62 mm. Ocelli exceedingly large (larger than in any other North American species); the maximum diameter of the posterior 0.21 mm.; distance between them 0.20 mm. (0.95 their diameter); distance from nearest eye-margin 0.36 mm. (1.71 their maximum diameter); diameter of anterior ocellus 0.18 mm. Ocellar area imperceptibly elevated. Length of eye 0.76 mm. Distance between eyes and head process at posterior mandibular articulation 0.21 mm. (0.28 the length of the eyes). Antennal tubercles approximate, with a strong tuft of erect silvery hairs between and above them; lacking a strong oblique carina running up them and the frons; a short dentiform, oblique carina between them and the eye margins above the antennal scrobes. Below the insertion of the scapes arise two carinae (connected in a loop dorsad) that run down, nearly parallel, to the dorsal margins of clypeal basin (Fig. 18); they delimit a narrow, elongate, rather shallow basin, less than 0.06 mm.

¹¹ Through an oversight Fig. 18 (Part I, p. 36) is labelled as "*Ephuta ocellaria* sp. n." This latter is an earlier species name that was dropped because of nomenclatorial reasons.

wide and about 0.25 mm. long (i.e., over four times as high as wide); at their anterior lateral ends they connect to the widely flaring clypeal carinae that run down to the reflexed margin of the clypeus, thus setting off a wide, truncated triangle, with the long side (anterior margin) about 0.24 mm. wide (0.39 the distance between the eyes below their emargination), which is about four times as wide as the subantennal basin; the declivent clypeal basin, measured to the reflexed anterior margin, is considerably lower than the subantennal; the two are separated by a low carina. Laterad of the subantennal carinae there is considerable long, but fine, brush-like pubescence. Mandibles normal, not truncate apically, their apex acuminate, unidentate apically, with a subapical tooth within; lacking a molar surface; punctate and pubescent on basal halves. Antennae with bicarinate scape and subglobose pedicel with some long silvery hairs; the latter as wide as long, subequal in length to the first and second flagellar segments; these slightly shorter than the third which is still wider than long.

Alitrunk moderately to somewhat coarsely sculptured, entirely black. Pronotum moderately narrowed anteriorly (0.75 as wide at the humeri as at the tegulae), the humeral angles very feebly developed; 1.24 mm. wide at humeri (0.79 the width of the head); 1.65 mm. wide at tegulae; its dorsal face rounded into the cephalic plane gradually, the latter punctate above and smooth and glabrous below. Dorsal surface of pronotum rather coarsely, closely punctured, but the punctures distinctly separated; the lateral pieces similarly sculptured dorsad, but smooth, except for abundant setigerous micropunctures, below; the smooth area obliquely traversed by the moderately developed backward extension of the humeral carinae; dorsally with rather dense appressed and sparser erect pubescence. Mesonotum with punctures scattered and shallow, much less closely punctured than pronotum and much less appressed-pubescent. Scutellum with unusually large, shallow punctures, as large as those of mesonotum, and considerable long, erect pubescence; flatly inflated, scarcely gibbous. Mesopleura very densely pubescent, obscuring the puncturation; chiefly of short, appressed, but also of long erect hairs. Metanotum with moderate punctures, nearly obscured by abundant, fine, silvery pubescence. Tegulae smooth, except for small setigerous punctures, not carinate, conchiform; 0.71 mm. long (0.89 as long as lateral length of pronotum). Dorsal face of propodeum irregularly areolate-reticulate; a large, elongate, irregular, smooth areole extending from the anterior margin of the propodeum to the rather weak, transverse propodeal carina, which is rather strongly dentate medially; dorsal face with only moderate, appressed, fine pubescence, that does not obscure the areolation; posterior face shallowly, obscurely areolate dorsally; lateral faces coarsely, deeply foveate-reticulate dorsally, more shallowly sculptured below. Legs black, rather densely silvery pubescent; the femora and tibiae, on their outer faces with many small setigerous micropunctures; middle tibiae slightly longer than the first and second tarsal segments combined; the longer calcar subequal in length to the first tarsal segment. Wings rather weakly infuscated, at base even more weakly so. Free part of M_4 scarcely four-fifths as long as either m-cu, free part of M_{3+4} , or the sector of M between m-cu and the origin of M_{1+2} and

M_{3+4} . R-m only a little longer than the sector of M between m-cu and r-m; nearly twice as long as sector of Rs between r-m and the origin of R_5 . Sector of R_{3+4} between origin of R_5 and origin of R_3 and R_4 less than twice as long as sector of Rs between r-m and origin of R_5 . Cell R_5 short, only twice as long as high.

Abdomen black, the pubescence silvery, moderately sparse, long and erect, except for the apical bands of dense, curly, appressed pubescence on the first and second tergites. Petiole coarsely punctured above and laterally, the apical half with punctures obscured by the pubescent band; ventrally with a high carina, produced anteriorly as a strong tooth; not bidentate. Second tergite with sparse, widely separated, deep, coarse punctures; those on the sides much closer; lateral margins finely, setigerously micro-punctate. Second sternite very coarsely, deeply, closely, setigerously punctured, much more so than the tergite; the punctures slightly less coarse laterally; apically with a thin band of slightly denser pubescence, and a row of long hairs. Apical tergites finely punctured and pubescent, except for the somewhat more coarsely and shallowly punctured pygidium. Apical sternites sparingly punctured and pubescent, the largely yellow-white hypopygium more coarsely so.

Holotype: Stone Mountain, Georgia, August 6, 1931 (Bradley and Knorr), in the collection of Cornell University.

This very distinct new species differs from most other members of the genus in the possession of very large ocelli (Table 1).

It differs from *E. battlei* in which the ocelli, though large, are still appreciably smaller, in having the subantennal pit very high and narrow, higher than the clypeus, instead of minute, subquadrate and very low. It also is entirely black, while typical *battlei* has a red second abdominal segment. The tegulae are also smoother, lacking coarse punctures, and the humeral angles are not nearly as strongly produced; furthermore, there is no trace of the carinae running up from the antennal tubercles. The relatively weakly sculptured genae, that are not carinate behind will separate the species immediately from any form of *battlei*.

It is more closely related to *E. margueritae*, *rufisquamis*, and *ecarinata*, than to *battlei*, for the configuration of the subantennal and clypeal basins is more nearly similar and the transverse propodeal carina is similarly dentiform medially.

From *scrupea* it differs in the smooth tegulae and the possession of a transverse propodeal carina, as well as in the large ocelli. However, the subtennal pit of *scrupea* is not so very different.

Ephuta tegulicia Bradley (Fig. 23).

?1894-96 *Mutilla idiasta* Cameron, Biol. Centr.-Amer., Hymen. 2: 312.

1916 *Ephuta tegulicia* Bradley, Trans. Amer. Ent. Soc. 42: 193, male.

Holotype: Male, Fedor, Lee County, Texas, June 1-7, 1909 (Birkman), in the collection of Nathan Banks (Museum of Comparative Zoology, Type No. 13733; examined June 1951).

Distribution: Apparently very local; as far as known limited to southern Texas, south of the 31st degree of latitude, and southern Arizona. Probably occurring in Mexico.¹²

Records: TEXAS: Victoria, August 3, 1910 (J. D. Mitchell), one male; Fedor, Lee County, September 1900, one male; Lee County, May 1907 (G. Birkman), one male; Lee County, August 1910 (Birkman), two males; Dallas (Boll), one male; Fedor, Lee County, June 21, 1909, one male. ARIZONA: West Slope, Patagonia Mts., Santa Cruz Co., August 9, 1955 (Butler and Werner), one male (USNM).

This species differs from all other nearctic species in the form of the tegulae, which are strongly arched and roof-like, with a strong longitudinal median ridge throughout their length. The dense sericeous, silvery vestiture obscuring the dorsum of the propodeum, and the rather elongate, boat-like subantennal basin (narrowed on both ends), as well as the black hypopygium are characteristic. The humeri in this species are rather strongly produced and acute; the ocelli are moderately large (Table I). The species appears most closely related to the other forms with a dense vestiture of the dorsum of the propodeum, such as *E. psephenophila* and *margueritae*. These both have the hypopygium pale, the tegulae evenly convex, and the propodeal carina strongly dentiform produced medially; they furthermore have the humeri of the thorax very little produced.

Ephuta ecarinata, occurring in the same general region as *tegulicia* very closely resembles the latter; it has the thoracic humeri strongly produced, the ocelli of identical size, and the

¹² It is very probable that *E. tegulicia* will prove a synonym or subspecies of the Mexican *E. idiasta* (Cam.). The latter shares with *tegulicia* roof-like, tectate tegulae, a dorsally densely silvery sericeous-pubescent propodeum, and a quadrate to transverse petiole. Until material of *tegulicia* can be compared with the type of *idiasta* it appears wisest to retain the name *tegulicia* for the Texan material.

propodeum of similar form, and similarly densely pubescent dorsally. The white hypopygium of *ecarinata*, and the non-carinate tegulae (hence the name) certainly warrant specific separation of the latter.

Brimley (1938, p. 438) records *E. tegulicia* from North Carolina. I have examined the specimen upon which this record is based, and find it to represent *Ephuta margueritae* ssp. *xanthocephala* ssp. n.

***Ephuta ecarinata* sp. n. (Fig. 22)**

This species, with a known distribution from southeastern and south central Texas to Arizona and Mexico, is apparently the western member of the *margueritae-psephenophila* complex.

The decidedly smaller ocelli, as well as the much broader, not gutter-like subantennal basin are the chief characteristics that serve to differentiate it from *psephenophila*. *Ecarinata* (except in very small individuals in which the heterogonically-developed species characteristics are very poorly emphasized) has the humeri much more strongly developed than in *psephenophila*.

The much larger ocelli, more strongly developed humeral angles, and entirely differently shaped subantennal basin serve to separate *ecarinata* from the eastern *margueritae*.

Superficially *ecarinata* is almost a duplicate of the relatively distantly allied *tegulicia*. The vestiture, degree of development of the sculpture, size of ocelli, development of the subantennal ridges and the basins they delimit (Fig. 22), are identical in both species. The noncarinate tegulae and yellow-white hypopygium of *ecarinata* at once distinguish that species from *tegulicia*.

The relationship between *ecarinata* and *neomexicana* requires further study. The decidedly smaller ocelli of the latter form, the less obvious development of sericeous vestiture, and the more weakly developed humeri of the latter strongly indicate that *neomexicana* probably does not belong to the *margueritae* complex. The relationships of that subspecies may be more with *cephalotes*, sp. n., described on a following page.

Critical study of available material indicates that *ecarinata* is to be divided into two distinct races, a Texan-eastern Mexican subspecies with smaller ocelli and denser vestiture, and an Arizonan subspecies with the ocelli larger, the vestiture sparser, and the median propodeal tooth only weakly developed. Until opportunity is available again to study the type of *neomexicana* it is tentatively left as a third subspecies of *ecarinata*.

Ephuta ecarinata subsp. *ecarinata* sp. et subsp. n.

MALE, length 7-8 mm. Totally black, except for the yellow-white hypopygium; rather densely silvery pubescent, the head, pronotum, mesopleurae, and dorsum of propodeum with a rather conspicuous vestiture of decumbent, sericeous, silvery hairs. Subantennal carinae triangularly dentiform produced about half-way down to anterior clypeal margin, the teeth connected by a transverse ridge (thus delimiting an elliptical-ovate, boat-shaped subantennal basin, about twice as high as wide). Tegulae on basal sixth slightly ridged, but not carinate, more or less evenly convex, with fine and moderately small, rather close punctures on limited central portion, the wide flange with minute setigerous punctulation. Propodeum distinctly divided into a densely sericeous pubescent, areolate, dorsal portion, and a nearly vertical posterior face, by a low transverse ridge that is distinctly produced medially into a moderate erect tooth.

Head transversely oval, 1.8 mm. wide. Sculpture on front and vertex moderate as regards coarseness, but close to contiguous, rather irregular, not deep; genae more coarsely, sharply punctate-reticulate, evenly rounded behind into the postgenae. Eye-length subequal (1.0-1.08) to the minimum frontal distance apart of eyes. Ocelli moderately large, length 0.18 mm.; ocellular distance 0.38 mm. (2.11 times the ocellar length); interocellar distance 0.27 mm. (1.50 times the ocellar length); distance from anterior ocellus 0.14 mm. (0.78 the ocellar length). Antennal tubercles lacking distinct suprascrobal ridges; scape bicarinate, the lower edge with the carina sharper; pedicel obconic-subglobose, ratio of its length to first, second and third flagellar segments respectively 1.7; 1.8; 1.7; 2.1. Vestiture totally pale, silvery, erect and decumbent, the front, vertex and genae with a thin, sericeous, curly vestiture in addition to the erect, sparser hairs.

Alitrunk black, moderately weakly sculptured. Pronotum with rather strongly produced humeral angles, subdentiform projecting, the pronotum in dorsal view trapezoidal, with the mesoscutum cutting into the base of the trapezoid at an obtuse angle, almost to the cephalic declivence of the anterior pronotal margin; puncturation of pronotum moderate in size, but close, angular, contiguous; vestiture pale, erect and with a rather thin pile of decumbent silvery, curled, hairs; lateral pronotal faces with the oblique posterior fork of the humeral carinae moderate, distinct, but not acutely, sharply developed; dorsal part of lateral pronotal faces concave, along upper border with the notal sculpture obsoletely extended into them, otherwise smooth (except for the minute punctulations, which give rise to a thin vestiture of microscopic hairs); width of pronotum at humeri 1.62 mm. (0.90 the width of head); width of pronotum at tegulae 2.01 mm. (width at humeri 0.8 the tegular width). Mesoscutum much more coarsely, irregularly punctured, the rounded intervals narrow to obsolete; with erect, sparse, off-white vestiture; scutellum not swollen, nearly flat, with close, regular, rounded-polygonal punctures, much inferior in size to those of mesoscutum. Tegulae as described above, rather thin and hyaline except medially, with a distinct, moderate fine vestiture. Mesopleura evenly swollen, contiguo-confluently punctured, the punctures subequal in size to

those of dorsum of pronotum, the vestiture of moderately dense, sericeous, decumbent, curled hairs, and sparse, suberect hairs (somewhat obscuring sculpture). Metanotum with 2-3 coarse punctures on the central, slightly elevated portion, laterally depressed, smooth, with a thin silvery pile. Metapleura smooth and polished, except for a few coarse punctures ventrally, and for a few sparse minute punctulations, bearing fine, microscopic hairs. Propodeum coarsely areolate dorsally, with the areolation deep, obscured by the rather thick mat of decumbent silvery, pilose-sericeous hairs; lateral faces with posterior halves deeply, closely punctate-reticulate, foveate, glabrous, the anterior halves glabrous and smooth, impunctate, forming a smooth wide gutter bordering the metapleura. Legs piceous-black, with pale white calcei and thin silvery vestiture. Wings virtually hyaline basally, the distal halves slightly fumose, the veins a moderately deep brown.

Abdomen black, except for the hypopygium; petiole extremely short, transverse, with very little dorsal face, with several transverse rows of contiguous coarse punctures, obscured except along posterior margin by the dense, sericeous silvery border of hairs; ventrally with a low, median keel, rather angularly produced anteriorly. Second tergite with rather small, very regular, rounded, subcontiguous puncturation (laterally the narrow intervals with some punctulations giving rise to thin vestiture of microscopic decumbent hairs); distal border of sericeous, silvery hairs rather dense and broad. Second sternite with moderately coarse, moderately close punctures, with rounded intervals. Disk of second segment and distal segments entirely white pubescent. Distal tergites with sparse, entirely erect, thin fringes of hairs, arising from moderately distinct to close, rather small punctures. Pygidium contiguo-confluently, slightly more coarsely punctured, with a little sericeous, decumbent vestiture, in addition to the erect hairs. Hypopygium yellow-white, similarly punctured as pygidium, with subdecumbent white hairs.

Holotype: Lee County, Texas, August 1906 (G. Birkmann) in collection of Museum of Comparative Zoology.

Paratypes: Fedor, Lee County, Texas, October 1909 (G. Birkmann); Texas (Belgrave); Texas, no other data; Edinburgh, Texas, July 1935 (S. Mulaik) one male; Brownsville, Texas (J. C. Bridwell); Mexico, no other data, one male; Texas, no other data, one male.¹³

This species, with its subspecies, differs from related forms bearing a considerable vestiture of the dorsum of the propodeum by the following combination of characters: tegulae smooth, with at most a few scattered coarser punctures; ocelli moderately large; humeri rather strongly produced (width at humeral angles about 0.9 the width of the head); hypopygium yellowish-white; transverse propodeal ridge not very strongly dentiform produced

¹³ An additional specimen, from Brownsville, May 15, 1935, has been seen.

medially; subantennal ridges with the configuration essentially similar to that of *E. tegulicia*.

This species is rather similar, in most ways, to *E. tegulicia*, but differs from it in the simple, ecarinate form of the tegulae, and in the yellow-white hypopygium. Except for these two characters the two species are virtually identical. The lack of a median strong tooth of the propodeum separates the species from both *psephenophila* (which has weaker humeri and much larger ocelli) and *margueritae* (which has weaker humeri and smaller ocelli). Both of these species also differ from *ecarinata* in the form of the subantennal carinae.

The individual from Brownsville, Texas (J. C. Bridwell), deposited in the United States National Museum, should perhaps be separated from *ecarinata* proper. In the more weakly developed humeral angles (compare Table I) it approaches *grisea*, while in the weaker vestiture of the dorsum of the propodeum and in several other characteristics it is similar to *ecarinata pima* ssp. n., treated below.

This subspecies represents the eastern population of *ecarinata*; it is limited to Texas and Mexico, as far as material examined is concerned. The female sex is unknown, but *E. auricapitis* or *sudatrix* may represent the female sex.

The chief differentiating characteristics between the typical subspecies and the subspecies *pima* (briefly diagnosed below) are given in the key. *E. e. ecarinata* has smaller ocelli, with the ocellocular distance distinctly greater than twice the ocellar length (in *pima* not to scarcely more than twice the ocellar length); the transverse propodeal carina is better developed in *ecarinata*, with the median tooth much more amply developed; the dorsal propodeal face is also more distinctly and densely silvery pubescent.

Ephuta ecarinata subsp. *pima* sp. et subsp. n.

Identical with typical *ecarinata*, but the ocelli somewhat larger (ocellocular distance 1.8-2.1 the ocellar length), the sericeous decumbent vestiture more weakly developed (the dorsal portion of the propodeum with the areolation not at all obscured by pubescence), and the median propodeal tooth obsolete or weakly developed.

Holotype: Tucson, Arizona (Snow), in collection of University of Minnesota.

Paratypes: Phoenix, October 10, 1934 (R. H. Crandall), one paratype.

The head measurements and prothoracic measurements of this subspecies are contrasted with those of typical *ecarinata* in Table I. It should be stressed that in typical *ecarinata* occasional individuals (like the one from Brownsville cited in the Table), have the humeral angles less strongly developed, and have the vestiture less dense and the propodeal tooth less obvious. Such individuals may easily be mistaken for the present subspecies, but will not be confused if the difference in ocellar size is kept in mind.

Since the completion of the manuscript several specimens referable to this taxon have been seen, including: West slope Patagonia Mts., Santa Cruz Co., Arizona, Aug. 9, 1955 (Butler and Werner) (USNM). This individual is more robust and better developed and shows several differences from the nominate subspecies that suggest a wholly distinct species may be at hand: (1) the tegulae are somewhat sharply tectate on their basal halves and very smooth, with only scattered, minute punctures; (2) the oblique carinae transversing the lateral pronotal faces are quite obsolete, rather than moderately sharp; (3) the legs are black, rather than castaneous. However, this extreme individual appears to be closely related to a more "typical" specimen of *E. ecarinata pima*, from Casa Grande, Arizona, Sept. 28, 1955 (Butler) (USNM). In this last individual the tegulae are less dark, bear coarser punctures centrally, and are less tectate basally. However, the legs are virtually black and the lateral oblique pronotal carinae are equally obsolete. Connecting the two extremes is a third individual, from Z. Marana, Arizona, July 6, 1955 (Butler and Werner) (UA), in which the tegulae are non-tectate, but are very slightly punctured and highly polished, while the legs are virtually black.

***Ephuta ecarinata* subsp. *neomexicana* sp. et subsp. n.**

MALE. Length 7.7–8.0 mm. Closely resembles *cephalotes*, but lacks the strongly conical elevation of the ocellar region, has the punctures of both frons and vertex much coarser, contiguous to subconfluent; the punctures of the mesonotum are also coarser; cell R_4 is distinctly hexagonal (free part of vein M_2 arises considerably before R_4 joins $R_5 + M_1$), and the wings are distinctly, if not strongly, infuscated; in *cephalotes* M_2 arises just before R_4 joins $R_5 + M_1$ (cell R_4 is thus pentagonal), and the wings are much

less noticeably infuscated (subhyaline); the humeri are more acute than in *cephalotes* (width at humeri 1.51 mm., 0.85 the width of the head; 0.75 the width of the prothorax at tegulae), although the thorax at humeri is scarcely wider than in *cephalotes*; the pronotum is not evenly rounded into the cephalic surface in *neomexicana*, and the cephalic surface is glabrous and impunctate (in *cephalotes* the dorsal surface is evenly rounded into the anterior face, and the puncturation is continued down, gradually becoming sparser and less coarse).

The ocelli are small, differing somewhat in size from those of *cephalotes*; the length of the posterior is 0.13 mm.; their distance apart 0.30 mm. (2.31 times their length; in *cephalotes* 2.58); their distance from the anterior is 0.18 mm. (1.38 their length; in *cephalotes* 1.67); their distance from the eyes is 0.45 mm. (3.46 their length; in *cephalotes* 2.80 their length).

Holotype: Sandoval Co., New Mexico, 6000 ft. altitude, August 21, 1939 (Rehn and Rehn), in the collection of the Academy of Natural Sciences, Philadelphia.

This form is related to *ecarinata* and *cephalotes*. It resembles the latter in the shape of the tegulae (convex, but not ridged basally, with a wide, less convex, translucent flange; disk with some scattered, moderate punctures, otherwise polished), which are somewhat hirsute in the present form, however. In both forms the upper carinae of the scapes are much weaker than the lower (nearly obsolete at times); both have dense, appressed silvery pubescence above the antennal tubercles; both have the punctulate, lateral, microsetose areas of the second tergite very well developed; in both forms the propodeum is similarly sculptured and its pubescence is equally sparse; the shape and sculpture of the scutellum is identical; the well-developed, rather dense vestiture of the head, pronotum, mesopleura, and of the body in general is equally developed in both forms; the punctures of the dorsal surface of the pronotum are extended down to the upper half of the side pieces in both; the disk of the second tergite is equally sparsely, weakly punctured towards its apex in both forms.

The subspecies differs from both other forms of *ecarinata* at once in the much smaller size of the ocelli. The spatial arrangement of the ocelli (i.e., relation between interocellar and ocellular distances) approximates that of *ecarinata* more closely than that of *cephalotes*, while the unproduced ocellar region also would allay the species more with *ecarinata*. However, *ecarinata* and the subspecies *pima*, as regards size of ocelli, may be the ex-

tremes of a cline, with the member with smaller ocelli in the east. The occurrence of *neomexicana* in the region between *ecarinata* and *pima*, and its much smaller ocelli, therefore, are quite inexplicable. It therefore seems that *neomexicana* may eventually be found to represent a discrete species. Upon the basis of the single available specimen a more conservative course appears warranted at present.

Ephuta sudatrix (Melander) (Figs. 33, 34)

1903 *Mutilla sudatrix* Melander, Trans. Amer. Ent. Soc. 29: female.

Type: Fedor, Texas, May 16, 1899 (Birkmann)¹⁴

Plesiotype: Fedor, Lee Co., Texas, May 12, 1902 (Birkmann), in collection of Museum of Comparative Zoology.

Records: Brownsville, Texas, May 8, 1935 (D. J. and J. N. Knull), one female; Brownsville, Texas, May 7, 1904 (H. S. Barber), one female; Los Borregos, Brownsville, Texas, May 21 and June 6, 1904 (H. S. Barber), two females.

This species is still known only from a limited area in southern Texas. The type was not available for examination, but the topotypic plesiotype listed above agreed with its description in every detail. From it the following description, not given in the original diagnosis, has been drawn.

Last tergite evenly convex, lacking a clearly defined pygidial area; laterally it is rather finely, evenly punctured, the punctures rather well separated, medially it is glabrous; its pubescence is golden-brown to rather strongly infuscated. Last sternum acuminate apically, with the tubercles of the base of the coarsely sculptured apical area distinct, well-developed, connected by a slight, obscure smooth ridge; at apex distinctly acuminate, not broadly truncate or emarginate at apex; the whole coarsely sculptured area is distinctly longer than wide at base, and bears very coarse punctures whose intervals are irregular and rounded into the punctures, the whole rather unevenly coarsely sculptured; bearing long pilose silvery hairs. Antennae with the tubercles prominent; the pedicel two-thirds as long as

¹⁴ According to a letter from Dr. Melander, the type is supposed to be in the collection of the Washington State College, at Pullman, Washington. A letter to that institution resulted in a statement to the effect that the type material deposited there by Melander had been placed in the general collection, available for student use, and that some of the material had disappeared; the rest had been sent on to Dr. C. E. Mickel, at the University of Minnesota. The type of *sudatrix* could not be located among the Melander material sent to Minnesota, so it appears probable that it is no longer in existence. For that reason, I have declared a specimen, conforming in every detail to Melander's satisfactorily detailed description, and topotypical with the supposedly lost type, as the plesiotype.

the first flagellar segment, which is about a fourth wider than long and but little longer than the second flagellar segment. Supraclypeal flange quadridentate, the teeth prominent, narrowly separated from each other, not strongly downward produced over the clypeus. The hypostomal-postgenal carinules are complete and distinct throughout, attaining the occipital ridge.

This distinctive species, overlooked by Bradley in his revision of the nearctic species of the genus (1916) has remained unrecognized, though Melander's description was quite satisfactory. The species is one of two North American forms that have only a slight, vestigial indication of a pygidial area. The entire apex of the gaster is more slender and elongate, with the last tergite and sternite more pointed and narrow. The hypopygium on superficial examination appears entire (Fig. 33), but under a magnification of $100\times$ or more (especially when the last sternite is pried away from the sting, or removed and placed on a slide), the very tip is slightly tridentate. This feature is shared with *E. margueritae*, but is not found in other species of the genus. The median, terminal tooth is about as wide as long, and corresponds with the strongly transverse, retuse, truncate or emarginate apical portion of the hypopygium in the forms with quadridentate hypopygia. This tridentate form of the apex of the hypopygium thus is to be interpreted as a modification of the more frequent quadridentate form, correlated with a narrowing of the sternite, and corresponding reduction of the usually bidentate apex into a single tooth. In addition to the undefined pygidial region, the large, silvery eyes, the golden yellow pubescent head, and the bimaculate disk of the second tergite are distinctive: these characters, as well as the form of the last tergite and sternite are shared with *E. margueritae*, though the sericeous vestiture and maculae in the latter species are much less conspicuously developed. The two species also share the presence of complete, well-developed carinules (flanked externally by slight grooves) that connect the hypostomal spinous teeth with the occipital ridge (which forms a nearly complete circle in all our species).

This species is very difficultly separable from the female of *E. margueritae*. In the present form the sericeous vestiture of the head is denser, thus more conspicuous, and the maculae of the second tergite are slightly larger, more conspicuous. These differences are very slight, yet the male sex of *margueritae* does not

extend west to Texas, hence *sudatrix* must be the female of a species of male distinct from *margueritae*. Therefore the slight differences between the two species in the pigmentation of the vestiture (see *E. margueritae*) appear to indicate two species are at hand.

E. margueritae sp. n.¹⁵

This species belongs to the *ecarinata-psephenophila* complex of males, agreeing with these two species in the yellow hypopygium, the presence of a distinct median tooth at the juncture of the dorsal and posterior propodeal faces, and the moderate to dense sericeous white vestiture of the dorsal propodeal face. The species differs from *psephenophila* in the much smaller ocelli and broader subantennal basin, that is not sharply separated from the clypeal basin. It differs from the very closely related *ecarinata* in the somewhat smaller ocelli, the much less strongly produced humeri, the subequally wide subantennal and clypeal basins (Fig. 17) that are not separated by a discrete transverse carina, and by the possession of a very strongly developed median propodeal tooth.

The species includes two racial types, with the typical form occurring in Florida (subspecies *margueritae*), while the other subspecies (subspecies *xanthocephala*) appears limited in occurrence to the Piedmont and Appalachian Plateau region of the Upper and Lower Austral. Both subspecies are known from both sexes.

E. margueritae subsp. *margueritae* sp. et subsp. n. (Fig. 17)

MALE. Length 8.5-9 mm. Entirely coal-black except for the abundant silvery pubescence (which is unusually dense for *Ephuta*); humeri weakly carinate, feebly produced. Sculpture moderately coarse. Propodeum with a comparatively feebly developed transverse carina. Tegulae ecarinate, impunctate except for a few fovea at base; with fine, setigerous punctures only.

Head transversely oval-obtrapezoidal, closely but not coarsely punctured (much less coarsely so than *E. sabaliana*) the punctures never confluent; those of the genae much larger, but never forming rows of areolae, not carinate behind; entire head densely, silvery pubescent, the pubescence chiefly fine and appressed, obscuring the sculpture; also with erect, long hairs, especially on the frons above the antennae. Maximum width of head 2.21 mm. (1.20 times the width of the thorax at the humeri). Ocelli rather

¹⁵ This species is named for my wife, *Olga Marguerite Schuster*, in appreciation for the constant help given during the twelve years during which this genus has been studied.

small (similar in size to those of *E. sabaliana*); the maximum diameter of the posterior ocelli 0.16 mm.; their distance apart 0.32 mm. (2.0 times their maximum diameter); their distance from the front ocellus 0.17 mm. (1.06 times their maximum diameter); their distance from the nearest eye margins 0.54 mm. (3.0 times their maximum diameter). Ocellar area nearly imperceptibly elevated. Length of eye 0.98 mm. (3.08 times the length of the distance between the lower eye-margin and the posterior mandibular articulation). The approximate antennal tubercles flattened above, densely pubescent and punctured above, carinate transversely towards their apices, entirely lacking the carinae that run up them and obliquely traverse the front in *E. stenognatha* and *sabaliana*. Antennal scrobes with a short, dentiform, high carina running into the base of the antennal tubercles. From below the antennae arise two carinae that delimit an oval subantennal basin, subequal in height to the clypeal basin, and very deeply and coarsely, setigerously punctured within. The two carinae that delimit the basin very high dorsad, suddenly diminishing in height half way down to the clypeal basin. Clypeal basin narrowly trapezoidal, smooth except for some setigerous punctures; the carinae that delimit it laterally suddenly diminishing in height and becoming obsolete before reaching the margin of the clypeus (thus the subantennal carinae are each biundulate). Clypeus as high as wide; width 0.31 mm. (0.31 as wide as the distance between the eyes, measured at the level of the antennal tubercles; in *E. sabaliana*, half as wide as the distance between the eyes); an area on each side of clypeus with long, brushlike, silvery, erect pubescence. Mandibles normal in size and shape, their width below the clypeus much less than the height of the clypeal basin, largely ferruginous, gently arched, acuminate, unidentate apically, with a smaller subapical tooth within; with some long, erect, silvery hairs. Subgenae smooth, strongly depressed below genae and sharply separated from them. Antennae blackish, the bicarinate scape with erect, silvery hairs; its carinae sharper and delimiting a deeper channel than in *E. sabaliana*; pedicel elongate, subconical, considerably longer than wide, with some erect, silvery hairs; slightly longer than first flagellar segment, which is subequal in length to the second flagellar and only slightly more than two-thirds as long as the third flagellar.

Alitrunk moderately punctured, entirely black. Pronotum rather strongly narrowed anteriorly (0.74 as wide at the humeri as at the tegulae), the humeral angles very weakly produced; 1.84 mm. wide at humeri (0.83 as wide as head); 2.49 mm. wide at tegulae; pronotal cephalic plane flat, smooth, shining. Length of pronotum from humeral angles to tegulae 1.21 mm. (0.66 times the width at the humeri). Sculpture of pronotum moderate dorsally, nearly entirely obscured by the appressed, dense, pilose silvery pubescence, the punctures round, distinctly separated; laterally the margins are similarly sculptured, but the lower parts of the lateral pieces are smooth, except for micropunctures that bear many fine, appressed pilose hairs. The obsolete backward extension of the humeral carinae traverses the side-pieces obliquely cutting them into two triangular sectors. Mesonotum more sparsely pubescent than pronotum, the punctures larger, subreticulate-areolate, frequently confluent, rather shallow, more or less arranged in

longitudinal rows. Mesopleura inflated, very densely, silvery pubescent, the more abundant appressed hairs nearly obscuring the moderately large punctures. Scutellum closely, confluent punctate, the punctures deep, but only about half the size of those of the mesonotum; somewhat inflated, but nearly flat on top. Tegulae folded, but not carinate, nearly smooth except for the setigerous micropunctures, 1.10 mm. long (0.91 times as long as the pronotum laterally). Metanotum with some punctures; entirely obscured by the dense, silvery pile. Transverse carina of propodeum weak, consisting of a strong median tooth and a vague, poorly defined transverse ridge on each side that becomes obsolete laterally; the areolae of the dorsal face entirely obscured by the conspicuously dense silvery, appressed, pilose pubescence; lateral faces subreticulate dorsally; posterior face shallowly, coarsely, longitudinally areolate. Legs blackish, with silvery, erect pubescence; middle tibiae considerably shorter than first two tarsal segments; the calcaria strongly unequal in length, the longer subequal in length to the first tarsal segment. Wings moderately infuscated throughout, somewhat less so at base. Free part of M_4 slightly shorter than $m-cu$, $\frac{1}{5}$ shorter than M_{3+4} . $R-m$ at least $\frac{1}{2}$ longer than the sector of R_s between $r-m$ and the origin of R_s . Free part of R_5 equal in length to $r-m$ and half again as long as the sector of R_s between $r-m$ and the origin of R_5 (differing thus from *E. scrupea*, where R_5 is considerably longer than $r-m$). Sector of R_{3+4} between origin of R_5 and origin of R_3 and R_4 twice as long as the sector of R_s between $r-m$ and R_5 (agrees with *E. scrupea*; but in *E. sabaliana* the two are subequal). Cell R_5 is nearly three times as long as high (in *E. scrupea* it varies from 2.1 to 1.8 times as long as high).

Abdomen moderately sculptured, black except for the dense bands of appressed silvery pubescence at the apices of the first and second tergite, and for the rather abundant, long, erect, silvery pubescence scattered all over the abdomen; the last ventral segment whitish. Petiole subquadrate in outline from above, its anterior face concave, with the ventral, anterior angles produced; rather coarsely sculptured dorsally, but the punctures obscured on apical half by the dense vestiture; ventrally with a strong median carina that is not hollowed out medially (i.e., carina not bidentate); anteriorly the carina is produced as a very strong dentiform process; lateral areas of sternite with a tuft of erect pilose pubescence each. Second tergite with moderate, well-separated punctures, those of the lateral margins more dense, however; the smooth lateral margins and a broader area dorsally on each side with numerous fine, setigerous micropunctures bearing pilose silvery pubescence, forming a rather conspicuous lateral border. Erect pubescence of tergites 2-7 rather abundant, conspicuous (somewhat more so than in *E. scrupea*). Second sternum with coarse, but well-separated punctures (much coarser than second tergite), with considerable erect silvery pubescence, that of the apex forming a weak band. Apical sternites similarly pubescent, black, except for the whitish hypopygium.

FEMALE. Length 7-9 mm. Integument deep ferruginous, locally piceous tinged; legs a piceous red. Vestiture largely fuscous tinged; sericeous vestiture of head fuscous or burnt golden, except adjacent to antennal tubercles, and on clypeus, where pale to golden; maculae of tergum two of abdomen golden; abdominal terga 3-5 with obscure, pale, decumbent to appressed patches on each side of midline, the midline and broad lateral

areas entirely with decumbent and erect blackish hairs; pygidial segment largely (or partly) with dense "beard" of silvery hairs, largely obscuring the impunctate, nitid, median strip of the tergum; setigerously punctured lateral areas with punctures small but contiguous.

Head transversely oval, with large, somewhat silvery eyes; lowermost edge of front with erect and finer decumbent, sericeous golden hairs; rest of front, vertex and occipital region, and upper genae with erect, fuscous to blackish, and decumbent, burnt-golden to fuscous vestiture; the erect hairs arising from subcontiguous macropunctures, the decumbent, finer, more sericeous hairs arising from scattered micropunctures situated on the narrow puncture-intervals (at least in largest part); lower genae with pale to silvery, sparse, erect, and scarcely denser, decumbent, sericeous hairs; carinules bordering the hypostomal region (and ending in small, sharp teeth), obvious, sublamellate, high; carinules running up from the sharp teeth of the hypostomal carinules (i.e., the carinules bordering the subgenal region, running up to join the occipital carina) somewhat undulate, discrete throughout, sharply separating the genae from the glabrous and highly polished postgenae.

Alitrunk deep ferruginous, with contiguous-confluent puncturation, that of the pleurae merely contiguous; dorsal vestiture fuscous, except on propodeum, which bears a dorsolateral, short, ill-defined stripe of silvery, sericeous hairs on each side.

Gaster with tergum two with very close, nearly circular, contiguo-confluent, moderately coarse punctures, with suberect, fuscous vestiture (except on lateral, basal and distal narrow margins); disk with a small, obscure pair of widely separated golden maculae formed of decumbent, fine, sericeous hairs, anterior to midline of tergite; apex of tergum with subequally wide, dense, silvery, sericeous band, narrowly interrupted in middle. Distal terga with vestiture as above. Abdominal sterna entirely with sparse, silvery hairs; hypopygium with the silvery hairs forming an obscure, lateral brush near apex, on each side. Pygidium scarcely distinct, a narrow, cuneiform, nitid median strip free of punctures, almost hidden by the densely setigerously punctured lateral portions of the segment (whose hairs arch across and hide the narrow pygidial region); pygidial region undefined, except very obscurely on distal $\frac{1}{2}$ or less of segment (forming a vestigial pygidium less than $\frac{1}{16}$ the width of front between eyes).

Holotype: Male, Larkins (South Miami), Florida, April; in Museum of Comparative Zoology.

Paratopotype: Same data, retained in writer's collection (to be deposited in collection of Cornell University).

Allotype: Female, Tampa P. Scrub, Hillsborough County, Florida, July 22, 1949 (D. J. Downes), to be deposited in collection of United States National Museum.¹⁶

¹⁶ A more complete description of the female is impossible at present, the allotype, supposedly in the United States National Museum (according to a letter received from the collector in 1951) not being in that collection at the time of writing (1956). The diagnosis given is a tentative one, made during the short period when the specimen was available to the writer in April-June 1951. In addition to the allotype, a second female was seen, considerably smaller in size. The collector had, unfortunately, failed to provide locality data.

This species differs abundantly from our other nearctic species of *Ephuta*. The weakly sculptured, evenly convex tegulae of the male and the dense vestiture of the dorsum of the propodeum at once place the species in the same group with *E. rufisquamis* André, *E. psephenophila* sp. n., *E. ecarinata* sp. n., and *E. tegulicia* Bdly. The white hypopygium separates the species at once from both *rufisquamis* and *tegulicia*, which furthermore have the subantennal carinae of a different configuration. The form of the subantennal carinae and the larger ocelli, as well as absence of a strong propodeal median tooth at once eliminate *ecarinata* from consideration. *E. psephenophila*, the other species that appears to exhibit some relationships to *margueritae*, has relatively enormous ocelli, has the configuration of the clypeal basins and subantennal basins quite different (with the subantennal a narrow, gutter-like basin) and has less dense, less sericeous vestiture of the head.

Perhaps most characteristic, in the male sex, are the configuration of the subantennal ridges and the resulting subantennal and clypeal basins (Fig. 17). The subantennal basin is a shallow, ovate-elliptical depression, separated from the clypeal basin by a weak, transverse convexity; the subantennal basin is but little narrower than the clypeal, and the sharp carinae that delimit the two basins are biundulate, but are not dentiform or angulate at the corners where the two basins join. The antennal tubercles also bear a convex, curved, obscure ridge towards their apices, dorsally, on each side; these obscure ridges set off more or less U-shaped, flat, closely punctured, pubescent areas immediately above the antennal tubercles.

In the male sex the underside of the head of this species is very characteristically modified, as follows: the narrow area around the hypostomal ridges, and the postgenae are strongly depressed, smooth and nitid, and separated from the genae by a distinct ridge on each side, running from near the lower mandibular condyles (where it is sharpest, and where the resulting depression of the underside of the head is strongest) up to and joining the occipital ridges. The consequent ridges resulting, however, are quite different from the genal carinae that occur in groups *Pauxilla* and *Eurygnathus* (which never run into the occipital ridge, and never start at the mandibular condyles). The depressed parastomal and subgenal regions at once separate this

distinctive species from *E. ecarinata* and *tegulicia*.

The female sex of *E. margueritae* is very closely related to *E. sudatrix*, agreeing in the obsolete pygidial area, and in the dense, sericeous vestiture of the front and vertex, as well as in the presence of maculae of the second tergum.

Comparison of the allotype female of subsp. *margueritae* with that of the allotype of the subspecies *xanthocephala* reveals a number of differences which seem to be suggestive. The hypostomal-postgenal ridges which are equally slightly arched in both subspecies (e.g., with the hypostomal not at an angle with the postgenal) are much more strongly developed in subspecies *margueritae*, than in subspecies *xanthocephala*. The vestiture of the dorsum of the head in typical *margueritae* is strongly fuscous tinged (both the erect and decumbent sericeous hairs); in subsp. *xanthocephala* the head appears whitish, because of the glittering, nearly white, slightly yellowish tinged, erect and decumbent pubescence. The dorsum of the alitrunk in typical *margueritae* has the punctures scarcely more than half the diameter of the very coarse pleural punctures; in subspecies *xanthocephala* the dorsal punctures are more clearly contiguo-confluent and are considerably finer; they are only moderately smaller than the pleural punctures which are also uniformly contiguo-confluent. The disk of the second abdominal segment bears coarser, slightly more separated, rounder punctures in subspecies *margueritae* while the maculae are quite small and inconspicuous; in subspecies *xanthocephala* the punctures are contiguo-confluent throughout, with the intervals vestigial everywhere, and the distal maculae are somewhat larger and paler. The erect pubescence of abdominal terga 3-5, and portions of 6 are quite fuscous to blackish in typical *margueritae*, while they are nearly uniformly glittering and whitish in subspecies *xanthocephala*. Whether all of these differences will prove to be constant on examination of longer series must yet be determined. Perhaps most significant are the differences in development of the hypostomal teeth, and the rather distinct differences in puncturation (which are, however, conceivably heterogonically controlled).

The Floridan subspecies has the female darker ferruginous throughout, with the vestiture more deeply pigmented nearly throughout, compared with the northern subspecies (*xanthocephala*). The most obvious immediate difference lies in the

much deeper pigmentation of the vestiture of the head, which gives the Florida race a considerably different facies (suggestive of the *puteola* complex).

The allotype female is unusually large, approaching *E. tuma-cacori* in size; the second female seen is considerably smaller. Except for this, the two individuals are virtually identical, though the brush-like development of the suberect hairs of the pygidial tergum is much more luxurious in the allotype, and consists very largely of silvery hairs (in the other female, more sparse, with all but the terminal group of hairs more or less fuscous). The allotype also has the second abdominal sternum with a conspicuous vestiture of decumbent, fine silvery-white hairs; this is quite absent in the other female.

This female is extremely similar to *E. sudatrix*; if it were not for the fact that *E. margueritae* males are quite discrete from *E. ecarinata* males (the possible male of *sudatrix*), I would not consider the two females specifically distinct. The female of *E. margueritae* subsp. *margueritae* is a uniformly deeper pigmented insect, with much of the vestiture that is silvery in *E. margueritae* subsp. *xanthocephala* replaced by fuscous hairs. Except for these differences in pigmentation and pubescence, no others appear to occur (though the limited number of females seen fall into two sharply discrete categories as regards the pigmentation and vestiture). The differences between the females, therefore, appear to be clearly racial, e.g., subspecific—analogueous to the racial differences between the males.¹⁷

The female of this subspecies looks superficially more like *E.*

¹⁷ The most important of these pigmentational differences are those cited in the key:

1. The distinctly fuscous (hence less conspicuous, against the deep ferruginous integument) vestiture of the vertex and occipital region of the head (*vs.* a more conspicuous, silvery to ivory-white vestiture in the subsp. *xanthocephala*).
2. The very deep ferruginous pigmentation of the body and appendages (*vs.* pale ferrugino-testaceous in the subsp. *xanthocephala*).
3. The somewhat less shaggy, shorter-clipped vestiture.
4. The largely or entirely blackish erect hairs of abdominal terga 3-5 (very largely silvery in subsp. *xanthocephala*).

These differences are slight, and based on study of only a limited number of specimens (five in all), hence the relationship between these two types of females should be studied more fully, with especial reference to the ocular micrometer. (The female of subsp. *margueritae* was discovered only in 1951, some four years subsequent to study of the other materials, and when an accurate ocular micrometer was unavailable. Therefore the cephalic indices of the typical subspecies should be studied, in order to determine whether there are any constant separating features in this regard).

sudatrix in the deeper pigmentation, more slightly developed patches of silvery hairs on each side of the midline of terga 3-5, than it looks like the *E. margueritae* subsp. *xanthocephala* female. Both this and the next subspecies of *E. margueritae* differ from *E. sudatrix* in the less dense, less obviously golden vestiture of the head, and in the presence of at least slightly developed submedian patches of pale, silvery hairs of terga 3-5. The fuscous to subfuscous vestiture of the head of *E. margueritae* subsp. *margueritae* stands in direct contrast to the very pale vestiture of the head in the subsp. *xanthocephala*; both subspecies have in common the fact that the vestiture of the head is much less brilliant than in *E. sudatrix*.

The correlation of the female of this subspecies with the male is based on purely circumstantial evidence. *E. margueritae* subsp. *margueritae* is the only male of the *ecarinata-margueritae-psephenophila* complex known from Florida; the present female is the only female of that complex known from Florida. Furthermore, the female assigned here is certainly only racially distinct from the female of *E. margueritae* subsp. *xanthocephala* (whose correlation with the male can be regarded as certain).

Closely related to typical *margueritae* is the following race or subspecies, that appears to replace the typical species in the region from North Carolina to Pennsylvania.

***Ephuta margueritae xanthocephala* sp. and subsp. n. (Fig. 25)**

MALE. Length 6-7 mm. Closely related to the species, but has the propodeum much less densely pubescent; has cell R_5 not more than two and one-half times as long as high; has sector of vein M between m-cu and r-m subequal in length to r-m (five-sevenths that length in the typical species); the wings are less heavily infuscated (subhyaline).

FEMALE. Length 6.3 mm. Frons, vertex, and upper part of genae with rather dense, fine, appressed golden-yellow pubescence, in addition to the infuscated erect coarser hairs; disk of second tergite with two distinct, but small spots of similar hairs. Pygidium not distinctly defined by carinae, the median glabrous area narrow, evenly rounded into the lateral punctured areas; hypopygium appearing entire, not at all four-lobed or four dentate apically.

Head rather full in the temples, not suddenly and evenly narrowed behind the eyes, a rounded transverse rectangular in outline from above. Frons vertex and genae closely and deeply to contiguously punctured, the punctures of the frons and genae slightly less close; punctures each bearing a long, erect, setose hair, not or scarcely infuscated (except on lower frons and genae, where they are silvery). The intervals between the punctures

closely punctulate, each micropuncture bearing an appressed golden-yellow to ivory-white, fine hair (except on genae, where they are silvery). Clypeal area dorsally bounded by the usual quadridentate flange, but the teeth rounded, obtusely triangular, the two median ones separated by a deeper, yet obtuse incision. Genal-postgenal carinules running up to occipital ridge complete, sharp.

Alitrunk a longitudinal oval in outline, deeply contiguously and rather coarsely punctured dorsally, bearing long, erect, fuscous hairs, except on the anterior margin of the pronotum, where they are silvery. Pleura similarly sculptured, below rather more sparsely punctured; propleurae anteriorly with moderate vestiture of silvery, sericeous, appressed, hairs; with similar pubescence on dorsolateral margins of propodeum; pleurae otherwise with some sparse erect silvery hairs. Legs unicolorous with body, silvery pubescent, some of the pubescence slightly yellowish-tinged.

Petiole dorsally densely yellowish-white appressed pubescent, with some long, erect, silvery hairs. Second tergite with rather coarse contiguous to confluent punctures, each bearing an erect setose hair (those of disk infuscated, those of base, lateral margins, and apical margin silvery); anterior half of disk in addition with a pair of sericeous golden-yellow, rather small pubescent maculae. Apical margin with a dense, silvery to yellowish tinged band of dense, appressed, sericeous pubescence, interrupted medially by some dark pubescence. Apical tergites less coarsely punctured, towards the apex nearly impunctate, glabrous, shining; bearing erect infuscated pubescence (laterally, and on pygidium, silvery), on tergites 3-4, and less so on tergite 5 with some golden appressed, sericeous pubescence medially. Pygidium acuminate, no distinct pygidial area defined by lateral carinae, the median longitudinal area glabrous and shining, however. Longitudinal carina of petiole acutely dentiform produced anteriorly; laterad with considerable erect, fine, silvery pubescence. Second sternite more coarsely, less closely punctured, than second tergite, with sparse, erect and short, appressed, silvery pubescence. Apical sternites with the pubescence somewhat infuscated, that of the hypopygium quite dusky. Hypopygium on apical half with coarse, irregular sculpture, and, near its base, with a pair of distinct tubercles, connected by a more or less discrete transverse welt, the apex acuminate, not quadridentate.

Holotype, allotype, and two male paratopotypes: Rockville, Dauphin County, Pennsylvania (H.B. Kirk); the specimens were bred from cocoons of Hymenoptera found under stones, and emerged May 1, 1910-May 23, 1910. In the collection of Cornell University and the author's collection.

Paratypes: Raleigh, North Carolina, June 23, 1933, one male; Raleigh, North Carolina, Aug. 27, 1935, one female; Bluff Mountain, Chilhowee Mountains, Tennessee, June 22, 1941 (A. C. Cole, Jr.), one female.

This is one of few species of which we know both male and female with certainty. From the similarity of the males to

tegulicia Bradley, and *ecarinata* sp. n. and of the females to *sudatrix* (Melander), I feel reasonably certain that *sudatrix* will turn out to be the female of either *tegulicia* or *ecarinata*.

The female is quite closely related to *sudatrix*, which it resembles in lacking a distinct pygidial area, possessing sericeous, appressed, very pale golden-yellow pubescence on the head (hence the name *xanthocephala*), and similar maculae on the second tergite. It differs from *sudatrix* in the difference of pubescence color and pattern of the apical abdominal segments, in having the maculae of the second tergite weaker and the appressed vestiture of the head weaker (thus resulting in a general facies more like that of *puteola* than like *sudatrix*).

The distribution of these two forms is puzzling. The species is southern coastal plain (Sabalian), while the subspecies is restricted to the Transition and Austral, and is limited to the region above and west of the fall line. It appears evident that this is among our rarest of North American species of this genus.

The male paratype from North Carolina was reported by Brimley (1938) as *E. tegulicia* Bradley.

Ephuta rufisquamis André (Fig. 19).

1905. *Rhoptromutilla rufisquamis* André, Zeitsch. f. Hymn., 5: 366, male (Arizona).

MALE: Length 7.25 mm. Coal black, except for the legs, tegulae, antennal scape, pedicel, mandibles, and eyes, which are ferruginous; the pubescence is silvery-white. Humeral angles weakly carinate, not at all prominent. Sculpture of body rather weak for *Ephuta*. Propodeum lacking a strong transverse carina. Tegulae smooth.

Head transversely oval-obtrapezoidal, moderately sculptured, with the setigerous larger punctures rather shallow, not sharply defined, well-separated, interspersed with minute micropunctures; punctures of genae and post-genae somewhat larger, obscured by the relatively dense, decumbent pubescence; genae thus not coarsely foveate and not carinate behind. Pubescence very sparse, except on the lower frons and genae. Maximum width of head 1.63 mm. (1.27 times the width of the thorax at the humeri). Ocelli large for the genus; maximum diameter of the posterior pair 0.21 mm.; their distance from each other .22 mm. (1.05 their maximum diameter); their distance from the front ocellus 0.13 mm. (0.62 their diameter); their distance from the eye-margin 0.35 mm. (1.66 times their diameter). Ocellar triangle quite strongly elevated. Distance between eyes above their emargination 1.00 mm. (4.76 times the maximum diameter of the posterior ocelli; 1.35 times the length of the eye). Distance between eye and posterior mandibular articulation 0.21 mm.; length of eye 0.75 mm.

(3.57 times the distance between the eye and the mandibular articulation). Antennal tubercles flat above, approximate, irregularly, rather coarsely rugose above, entirely lacking any trace of the irregular carinae that runs up them in the *pauvilla* group and obliquely traverses the frons. High, sharp, dentiform, carinae occur between the eyes and the antennal tubercles, one on each side. Beneath the insertion of the antennae, two high, sharp carinae arising from a common base beneath and between the antennal tubercles, and diverging noticeably at first, and soon running subparallel to each other (diverging but slightly), delimit a high, narrow subantennal basin, higher than the clypeal basin beneath. Extensions of these carinae diverge widely and run down towards the anterior margin of the clypeus, but become obsolete considerably before reaching it, thus setting off a small, rather low clypeal basin whose width is 2.6 times the width of the subantennal basin and only 0.32 the width of the distance between the eyes below their emargination (which is 0.82 mm.). Clypeal margin somewhat reflexed apically. Mandibles normal in size and shape, quite slender, somewhat falcate, their width apically less than the height of the clypeal basin; unidentate apically, with a small subapical tooth within. Antennae with the bicarinate scape and the pedicel ferruginous; the flagellum dark mahogany in color; pedicel slightly longer than the first flagellar segment; the latter subequal to the second flagellar segment; the third 1.75 as long as the second. On each side of the face, laterad of the clypeal and subantennal basins occurs an area of long, erect, silvery, brush-like pubescence.

Alitrunk moderately sculptured, black, except for the ferruginous tegulae and legs. Pronotum strongly narrowed anteriorly (0.66 as wide at humeri as at tegulae), the humeri very weakly, yet distinctly produced (width at humeri 1.28 mm.; 0.79 as wide as head); width at tegulae 1.94 mm. The lateral length of the pronotum 0.95 mm. (0.74 as long as the width of the pronotum at humeri). Pronotum dorsally with rather close, large punctures; the side pieces similarly sculptured near their dorsal borders, but nearly smooth below, excepting the dense, setigerous micropunctures that bear abundant decumbent silver pile. The backward extension of the humeral carinae obsolete, running vaguely, obliquely downward. Mesonotum more sparsely punctured, the punctures more shallow; the inflated mesopleura more closely and densely punctured, but lacking the conspicuously denser pubescence found in *E. scrupea*. Tegulae strongly angulate-carinate basally, but becoming simply convex mesally, with a few coarse punctures on center of the disk, surrounded by a wide, smooth border bearing micropunctures only; sparsely pubescent. Scutellum inflated, scarcely gibbous, rather less closely punctured than in *E. pauvilla*, with erect, long pubescence. Propodeum with the dorsal face nearly evenly rounded into the posterior face, separated medially by a slight, crenulate transverse ridge. The dorsal face with the shallow areolation obscured by rather dense, fine, appressed silvery pubescence, and some long erect hairs; posterior face with some round large punctures, similar to those of the lateral faces. Tibial calcaria of the middle legs strongly dissimilar in length, the longer subequal in length to the first tarsal segment. Wings entirely hyaline, the veins conspicuously dark brown. Free part of M_4 0.75 the length of the free part

of M_{3+4} . The latter 1.6 times the length of the sector of M between r-m and the origin of M_{1+2} and M_{3+4} ; equal in length to the sector of M between m-cu and the origin of M_{1+2} and M_{3+4} ; equal in length to 1.1 the length of m-cu. M_4 equal to 0.84 the length of m-cu. R-m 0.4 the length of the cell 2nd R_{1+2} , equal in length to the sector of M between r-m and m-cu.

Abdomen with the petiole densely punctured dorsally, the sculpture obscured on apical half by the very dense border of appressed and decumbent silvery pubescence; ventrally with a median carina, dentate anteriorly and concavely hollowed behind the anterior tooth but not bidentate; with considerable erect, fine, silvery pubescence on the postero-lateral area of the sternite. Second tergite with rather deep, elongate, but well-separated, setigerous punctures, somewhat denser laterally and basally, very sparsely pubescent, except for the very dense apical band of silvery, appressed, curly pubescence. The lateral borders of the tergite with some sparse, setigerous punctures, bearing pubescence similar to that of the apical border. Apical segments with sparse, erect pubescence chiefly, inconspicuous, not in bands; punctures small, scattered. Second sternite with but a very few scattered punctures, except laterally and apically, where they are more abundant; pubescence almost none, except for a sparse border of hairs apically. Apical sternites with very sparse erect pubescence. Hypopygium lighter than other segments, but not whitish, with well-separated, moderate punctures.

Holotype: Arizona, in Museum Nationale d'Histoire Naturelle, Paris.

I have not seen the type of this species. The above description is based on an individual from Hot Springs, Arizona. André's type specimen came from Arizona, without further locality data. I have seen only the following specimens:

ARIZONA: Hot Springs, June 25 (Barber and Schwarz), one male; Empire Mountains, May 20, 1926 (Alt. 5000 feet), (A. A. Nichol), one male. CALIFORNIA: Antelope Springs, Inyo Co., July 17, 1953 (J. W. MacSwain), two males.

This abundantly distinct species differs at once from any other nearctic species in the possession of red legs and tegulae, and a red flagellum, contrasted with the entirely black body. In the pigmentation this species is identical with *E. carinata* Schuster, from Central America, but differs from that species in that the subantennal carinae are distinct above, and not fused to form a single median carina.

This species is apparently related to *tegulicia* Bradley, which also has a dark hypopygium and to *psephenophila* sp. n. with large ocelli like *rufisquamis*, as well as to *margueritae*. These

four species all agree in having the dorsum of the propodeum densely silvery pubescent. *E. psephenophila* and *margueritae* differ from *E. rufisquamis* in the pale hypopygium and distinctly dentiform-produced transverse propodeal carina, as well as the more fuscous wings and weaker contrast between veins and wing-membrane. The isolated *tegulicia*, in its carinate tegulae and black hypopygium, as well as smaller ocelli and strongly developed humeri, can scarcely be confused with the present species, which has a much narrower, more elongate subantennal basin (quite similar to that of the more closely allied *E. psephenophila*).

The female sex is conceivably represented by *E. tumacacori* sp. n.

***Ephuta cephalotes* sp. n. (Figs. 10, 20, 46)**

MALE. Length 8-9 mm. Entirely coal-black; moderately sculptured, with moderately dense, silvery vestiture. Head prominently, conically produced in the ocellar region, there glabrous and shining. Tegulae smooth, weakly convex, punctulate moderately, thin, translucent, except medially, shining. Propodeum with a moderately distinct, crenulate transverse carina. Wings nearly completely hyaline, the veins only infuscated.

Head moderately, distinctly punctured, the setigerous punctures well-separated; rather prominently pubescent with long, erect, silvery hairs, except for those on the lower frons, above the scrobal carinae, and on the genae, which are chiefly decumbent or appressed, finer, and much denser. Puncturation of genae much coarser, but not alveolate-reticulate, and not carinate behind, but evenly rounded into the occipital and postgenal areas; punctures of occiput and vertex also somewhat coarser than those of frons. Head with the ocellar area strongly elevated, conic, nearly smooth and impunctate at apex, the ocelli inserted on the sides of the cone. Ocelli moderately small; the posterior 0.12 mm. in diameter; their distance apart 0.31 mm. (2.58 their maximum diameter); their distance from the front ocellus 0.20 mm. (1.67 their maximum diameter); their distance from the nearest eye-margins 0.39 mm. (2.80 their maximum diameter). Oblique ridges running up the antennal tubercles and traversing the frons towards the eyes (thus forming suprascrobal ridges) entirely absent, the puncturation continuing down to the scrobal carinae, which are punctate and pubescent on their dorsal faces. Beneath the insertion of the scapes a pair of carinae, at first divergent and obscure, run down nearly parallel to within about one half the distance towards the anterior clypeal margin; there they are each produced into a strong triangular tooth (and are connected by a low transverse ridge); they then diverge abruptly, suddenly greatly diminish in height, and become obsolete and disappear long before reaching the reflexed margin of the clypeus. Thus a relatively narrow subantennal basin, not very deep, and poorly delimited dorsally, about twice as high as wide, is set off; the clypeal basin, which is of about the

same height, is a poorly defined, truncated, wide triangle, whose sides are defined only on top. Pedicel bead-like, scarcely shorter than first flagellar; the latter about a fourth shorter than second flagellar; third flagellar a third longer than second, scarcely one-fourth longer than wide. Mandibles normal, bi-dentate, lacking a molar area; their width at apex less than height of clypeal basin.

Alitrunk moderately to weakly punctured, for *Ephuta*, with moderate silvery pubescence. Pronotum 1.40 mm. wide at humeri (0.84 as wide as head), strongly, evenly widened to apex (width at tegulae 1.93 mm.); humeral width 0.74 that of the tegulae; humeral angles rather moderate, feebly dentiform; the dorsal face of pronotum rather evenly rounded into the cephalic; punctures of dorsal face moderate, rather close, less so near tegulae and near sides; the pubescence rather dense, silvery, somewhat obscuring the sculpture; side pieces of pronotum sparsely punctured, less coarsely than dorsal face, traversed obliquely by the inferior extension of the humeral carinae, bearing numerous micropunctures on the intervals between punctures that bear short, fine, silvery appressed hair. Mesonotum evenly, noticeably convex, with sparse, evenly scattered moderate punctures bearing erect silvery hairs. Scutellum flatly inflated, closely foveately punctured, the size of the punctures similar to those of mesonotum or larger; towards apex medially longitudinally sulcate; with moderate, erect silvery pubescence. Mesopleura strongly, evenly convex, with rather coarse, but well-separated punctures, with fine appressed and coarser erect silvery pubescence that moderately obscures the sculpture. Tegulae very smooth, polished and shining, except for very sparse moderate punctures bearing a few hairs; the sides and apical half very thin, transparent; the disk rather moderately convex, thicker than the more nearly flat edges; conchiform in shape. Propodeum with the reticulate-areolate dorsal face nearly glabrous, except the base and lateral margins with some sparse silvery pubescence; separated from posterior face almost at right angles, but nearly rounded into it narrowly, separated only by a weak transverse crenulate ridge; the posterior face reticulate-punctate dorsally, punctate to glabrous below; lateral faces with several rows of coarse punctures, nearly glabrous. Wings hyaline, the veins brown; vein m-cu nearly one-fourth longer than free part of M_{3+4} , fully one-fourth longer than free part of M_4 ; M from m-cu to origin of M_{1+2} and M_{3+4} equal in length to M_{3+4} ; M from m-cu to r-m one-half as long as M from r-m to origin of M_{1+2} and M_{3+4} ; r-m less than five-eighths as long as the latter sector, and scarcely longer than Rs from r-m to origins of R_5 and R_{3+4} . Cell 2nd R_{1+2} one-third as high as long, obliquely truncate at apex; cell R_5 over two and one-half times as long as high, at apex subacute. Legs black, the tarsi mahogany-red, with dense, silvery pubescence, that of the tarsi shorter and dirty-white or yellowish.

Petiole transverse, with a dense apical band of silvery pubescence and long, erect silvery pilose hairs; ventrally with a weak median longitudinal carina, not dentiform produced. Second tergite with punctures moderately coarse, close to contiguous, bearing erect to decumbent silvery hairs; laterally with a wide margin on each side of fine, sericeous hairs, simulating

“felt-lines” arising from close, fine micropunctures; apical margin with a prominent band of silvery sericeous pubescence. Second sternite with similar, but sparser, coarser punctures, sparsely silvery pubescent. Apical tergites with a broad band of moderate, rather sparse punctures; progressively on each segment the punctures become denser and coarser; those of the pygidium considerably closer and denser; with sparse, erect, silvery hairs. Apical sternites with similar punctures, but smaller and less close; pubescence similar, if anything, more sparse; hypopygium more coarsely and densely punctured, a dark brown, with short and long moderate silvery pubescence.

Holotype: Musquiz Canon, Fort Davis, Texas, July 6, 1917 (Cornell University Expedition), in collection of Cornell University (Type No. 2191).

Paratypes: North Dakota, Medora, August 3, 1923 (O. A. Stevens), one male; South Dakota, Philip, August 7, 1924, one male; Wyoming, Weston County, July 15, 1939, two males; Arizona, Tucson, June 13 and June 15, 1938 (R. H. Crandall) two males. A subsequent specimen (not paratypic) has been seen from South Dakota: Grass Rope, June 21, 1934 (H. C. Severin).

This very easily identified, abundantly distinct new species is related most closely to *grisea* and *ecarinata*. It differs from all the species of the genus known to me in that the vertex is conically produced. The frontal aspect of the species at once identifies it, the vertex being strongly elevated, the elevation terminating in a glabrous, shining tubercle or prominence in the middle of the ocellar region (the head, in frontal profile, thus acquiring a decidedly sharply angular profile between the eyes). The hyaline wings, as well as the very small ocelli are also of importance in distinguishing the species. The brownish buff to somewhat fuscous hypopygium (never clearly yellowish, never totally blackish) appears to be a constant distinguishing characteristic. In the entirely silvery white vestiture of vertex, mesonotum, and disk of tergite two, this species differs from the other members of the GRISEA complex that have similar (i.e., non-carinate) tegulae and fuscous hypopygia.

In Bradley's key (1916) the species keys out to *grisea*. It differs from the latter in the contour of the vertex, in the slightly larger ocelli, and in the form of the subantennal carinae (which are strongly dentiform produced on each side, about half their distance to the clypeal margin, and there connected by a transverse ridge), in the lack of infuscation of the wings, and in the

lack of sericeous vestiture of tergites 3-4 of the abdomen.

The female, judging from the range of size of the species (averaging only 7-9 mm.; smaller than our other North American species of *Ephuta*), may very well be *E. minuta* sp. n., which is uniformly the smallest species known in the female sex.

A male *Ephuta*, lacking the head, has been examined, and differs from the present species in having the scutellum nearly gibbous, less coarsely punctured, and in having the second tergite very finely, shallowly, punctured, compared with the present species. This specimen, from Jemez Springs, New Mexico (8,000 feet), May 22, 1916 (J. Woodgate), may possibly belong here, but probably represents a new species. It appears advisable to await more complete material before describing it, however.

Females of the *Albiceps* and *Grisea* Complexes not
Correlated with any Species of Males¹⁸

The seven species assigned here belong almost certainly, without exception, to males here assigned to the Species Group *Grisea*. They are dealt with as a unit here in order to make comparison between them simpler. Of the seven species known in the female sex, three were assigned previously to their respective males (*E. conchate*, *argenticeps* and *floridana*), therefore have already been dealt with, on pages 23, 16, and 34. The four remaining females cannot readily be assigned to known males, although *E. coloradella* may be the female sex of *E. grisea*, while it is possible that *E. baboquivari* is the female of *E. ecarinata*. The species involved have been keyed out in Couplets 5-12 in the Key given on pp. 31-32, in Part I. However, the complexity of the group is so great that the following supplementary key may be of value at this point:

1. Vertex with the erect and appressed vestiture either glistening white or ivory-white; second tergum of abdomen with discal maculae of appressed hairs 2
2. Genal-postgenal carinules complete; terga 3-5 with median third silvery pubescent; head white to ivory-white pubescent.

E. albiceps sp. n.

¹⁸ The females of these two complexes (defined on p. 16 of Part I) are superficially very similar, agreeing in the following respects: presence of sericeous, decumbent, fine microvestiture of the front and vertex, in addition to the erect, stiff setae; usual presence of maculae of the second tergum, formed of similar hairs; the simple hypopygium, without an elevated biramoso, V-shaped process; the presence of a distinct pygidial area. The species, as a consequence, are very similar and are easily confused with each other in some cases.

2. Genal-postgenal carinules incomplete; head silvery white pubescent, glistening; eyes small: the front 1.4-1.5 the eye-length; eye-length 0.77-0.79 the eye width 3
3. Terga 3-5 entirely fuscous pubescent; hypopygium at base with merely a pair of low tubercles **E. coloradella** sp. n.
3. Terga 3-5 with a median line of thin, silvery hairs; hypopygium with a sharp, transverse, basal carina **E. argenteiceps** sp. n.
1. Vertex with the appressed, sericeous vestiture varying from golden-yellow to fuscous (in the latter case often inconspicuous); second tergum with maculae present or absent 4
4. Second abdominal tergum without any trace of discal maculae; second tergum with small, very close, regular puncturation; hypopygium with a complete, sharp, basal transverse carina 5
5. Head a brilliant golden pubescent; eyes large, the minimal width of front between eyes only 1.2-1.3 the eye-length; genal-subgenal carinules complete.
E. baboquivari sp. n.
5. Head fuscous to golden-fuscous pubescent, dull in appearance; eyes smaller, the front 1.3-1.6 the eye-length; genal-subgenal carinules incomplete (*E. floridana*) 6
6. Head with decumbent sericeous vestiture dull, fuscous to griseous-fuscous. Florida.
E. floridana floridana sp. n.
6. Head with decumbent sericeous vestiture yellowish to golden, relatively bright in color.
E. floridana dietrichi sp. et subsp.n.
4. Second abdominal tergum with small to obvious discal maculae of pale, sericeous, appressed hairs 7
7. Vertex with decumbent vestiture golden or golden-yellow; brilliant; distal maculae of second tergum conspicuous; genal-postgenal carinules complete; eyes large: minimal frontal distance apart 1.0-1.2 the eye-length **E. auricapitis** sp. n.
7. Vertex with dull, fuscous sericeous vestiture; discal maculae small and inconspicuous; genal-postgenal carinules incomplete; eyes smaller; front between eyes 1.3-1.6 the eye-length.

E. conchate Mkl.

On the basis of the vestiture, a basic breakdown into two groups is possible here, one including *E. albiceps* and *E. auricapitis* (in which the discal maculae are large and conspicuous and the head is very densely sericeous pubescent), the second group including the remaining five species is characterized by the following series of features in common: in the minute or entirely eliminated discal maculae of tergum two, in the relatively less sparsely devel-

oped sericeous vestiture of the vertex and front of the head, and in the presence of a more or less distinct pair of basal hypopygial tubercles (often connected by a transverse glabrous ridge). Furthermore, all five species agree in the much smaller eyes and broader front (the latter 1.3–1.6 the maximum eye-length). In the latter character, *baboquivari*, with the front 1.2–1.3 the eye-length proves intermediate between the two species complexes. In the reduction of the discal maculae, reduction of sericeous vestiture of the head, development of hypopygial tubercles this latter group of species approaches the complex of species to which *E. puteola* belongs. Indeed, when the silky microvestiture of the head is fuscous, rather thin, and inconspicuous (as in *E. floridana floridana*) a very close superficial similarity to *E. puteola* obtains.

In contrast, the first group, with a relatively brilliant vestiture and with discrete maculae, strongly suggests the *Sudatrix* Complex (*E. sudatrix* and *E. margueritae*). The distinct pygidium of the entire complex dealt with here, and absence of such a pygidial area in the *Sudatrix* Complex effectively separate the two.

Ephuta coloradella sp. n.

FEMALE. Length 3.5 mm. Integument testaceo-ferruginous throughout, the antennae slightly darker, and the apices of the distal abdominal tergites a little tinged with piceous but the legs, head, alitrunk and greater part of abdomen nearly uniformly pigmented. Head with a thin vestiture of sericeous decumbent, silvery white hairs on vertex, and anterior part of disk of second abdominal tergite with vestigial maculae of similar hairs. Pygidial area relatively broad, defined; hypopygium laterally and distally entire, the disk at base with a pair of lateral, obscure tubercles not connected by a discrete ridge.

Head 0.93 mm. wide, rounded obtrapezoidal, somewhat evenly narrowed behind the eyes; with rather coarse, close to contiguous punctures on front, with the intervals virtually devoid of interspersed punctulations, bearing sparse, irregular suberect brownish-tinged hairs; vertex with smaller and more distant punctures, the relatively broad intervals more or less roughened and somewhat punctulate, the punctulations giving rise to fine, decumbent, sparse silvery hairs; coarser punctures of vertex with suberect, longer hairs, silvery on vertex and occiput, golden or brownish on front. Genae with coarse, rather close punctures and with scattered interspersed punctulations, the entire vestiture (erect and decumbent) silvery white. Hypostomal-subgenal ridges becoming obsolete above hypostomal spines. Front 0.53 mm. wide; eyes 0.37 mm. long, 0.32 mm. wide. Antennae scarcely darker than head; pedicel obtrapezoidal in outline, wider than long, 0.65 mm. long; first flagellar segment 0.09 mm. long \times 0.10 mm. wide; second flagellar segment 0.09 mm. long.

Alitrunk elongate, more or less obovate-elliptical, 1.17 mm. long, 0.69 mm. wide at prothoracic spiracles, 0.64 mm. wide at apex of the more conspicuous propodeal spiracles; with moderately coarse, close and contiguous to confluent puncturation dorsally and laterally, the puncturation much closer than on disk of abdominal tergite two. Vestiture dorsally sparse, of stiff, erect hairs and shorter, decumbent hairs, those of the dorsum of pronotum white, those of the meso-metanotal regions somewhat fuscous-tinged; the pleural faces uniformly whitish pubescent, sparsely and nearly equally so (the lateral pronotal faces without denser vestiture; the propodeum uniformly, sparsely pale pubescent and lacking indication of stripes).

Abdomen with disk of second tergite with moderately, distinctly separated oval, setigerous punctures not coarser than those of alitrunk, giving rise to subdecumbent fuscous, stiff hairs; base of tergite, as well as apical border and lateral fifths with the subdecumbent hairs white; apex of tergite with a broad, equally wide band of sericeous, curly hairs, interrupted in the middle, the lateral portions of the tergite with obscure regions of thinner, similar vestiture; anterior part of disk with a pair of vestigial maculae of similar hairs; integument of tergite rufo-testaceous, except the apical portion (underlying the silvery band), which is a translucent testaceous. Second sternite with very coarse, well-separated, round punctures and polished intervals. Tergites 3-5 with rather sparse and small setigerous punctures bearing long, suberect, fuscous hairs; intervals wide and polished. Pygidial tergite with lateral regions with close to contiguous moderately coarse punctures, bearing suberect fuscous and silvery hairs; central portion glabrous and impunctate, defined on distal fourth by delicate carinules and forming a relatively broad pygidial area, 0.13 mm. wide, which is obscurely granulose-rugulose distally. Hypopygium with a pair of low basal tubercles, not connected by a sharp transverse ridge; disk rather small, with distinctly separated punctures; apex not distinctly dentate, but each side just before apex with a minute vestigial tubercle on the lateral margins.

Holotype: Colorado Springs, Colorado, June 15-30, 1897, 6000-7000 ft. (H. F. Wickham), in collection of University of Minnesota.

This species I believe to be the female sex of *grisea*. The rather distinct sericeous vestiture of the head and body of *grisea* and *coloradella* suggests this, as well as the distribution. Since any concrete proof is lacking, the form will have to be considered nomenclatorially distinct for the present.

The species is extremely closely related to the female, *E. conchate*. It differs from the latter in the less obviously granulose pygidial area, the less close puncturation of the disk of the second tergite, the white (instead of fuscous) sericeous vestiture of the head and the pale integument of the apex of tergite two of the abdomen. The essential body dimensions, eye-size, form of hypo-

stomal teeth and carinules, and type of hypopygium are identical in both species, and both have the sericeous vestiture of the head very sparse (giving them the appearance of *puteola* and its allies), the integument of the body virtually concolorous throughout and rufo-testaceous, as well as the maculae of the second tergite obscure and minute.

Both species are related, though relatively distantly, to *E. floridana* and *baboquivari*, as well as *argenticeps*, but differ from all three of these species in the absence of a discrete ridge connecting the basal hypopygial tubercles. The relationship appears especially close to *floridana*, which has the head also more densely sericeous pubescent, but no maculae of the disk of the second abdominal tergite.

Ephuta albiceps sp. n.

FEMALE: Length 4.1 mm. Head densely appressed and erect white pubescent; the second tergite with a pair of silvery sericeous pubescent maculae on basal third; pygidial area clearly defined by lateral carinae.

Head transversely oval, not full in the temples; the punctures of frons rather close, but much less so than in *sudatrix*, much less sharply defined, not at all foveate; the pubescence entirely ivory-white and silvery, appressed sericeous, decumbent, and erect setaceous, except for a row of very long infuscated setaceous erect hairs encircling each eye. Antennae a yellow testaceous, the antennal tubercles not prominent, pedicel scarcely shorter than the first flagellar segment, which is wider than long, and shorter than the second flagellar segment; scape round in section, not carinate except at base, sparsely punctured, with decumbent sparse silvery hairs. Supraclypeal flange quadridentate, the teeth small, their intervals wide; the flange not strongly produced downward. Hypostomal region with a carina on each side running back from the posterior mandibular articulation, ending in a dentate process, continued dorsad as delicate, complete postgenal carinules.

Alitrunk obovoid, the head about 1.25 as wide; punctures close, contiguous; pubescence rather long, shaggy, silvery, except for the mesonotum, which is golden to ferruginous pubescent; the anterior pronotal margin is densely silvery, sericeous pubescent; the propodeum has a median and a dorsolateral line of pubescence on each side, of appressed sericeous silvery hairs; the pleura are rather densely silvery pubescent (much more so than in *sudatrix*); in addition to the normal, moderately long pubescence there are some scattered, very long, setaceous silvery hairs.

Abdomen rather densely, rather shaggy pubescent, the pubescence chiefly silvery. Petiole short, transverse, very densely sericeous silvery pubescent, with some scattered erect setaceous silver hairs. Second tergite with the punctures close, rather coarse, at times contiguous; coarser laterally; the posterior two-thirds of disk largely ferruginous to fuscous pubescent; basal

third sparsely decumbent silvery pubescent; broad lateral margins similarly pubescent, with much appressed sericeous silvery hairs in addition; apical margin with a broad band of dense silvery sericeous hairs, interrupted by a V-shaped median tuft of infuscated hairs; basal third of disk with a pair of prominent maculae of silvery, appressed sericeous hairs. Tergites three to five with median third silvery pubescent, the lateral area dusky pubescent. Tergite six laterally with silvery and golden, long pilose erect hairs; the pygidium defined laterally by carinae that extend about one-fifth the length of the tergite; the defined area broad (between a third and a fourth as wide as the tergite), nearly impunctate (slightly roughened by obscure fine punctulation) and shining. Petiole ventrally with a median keel, obsolete posteriorly, anteriorly weakly produced into a rounded median tooth. Second sternite coarsely foveately punctured, the punctures rather well-separated, bearing silvery decumbent hairs; pubescence denser apically. Apical sternites, except hypopygium with a narrow densely punctured apical band bearing a thin row of silvery hairs. Hypopygium with apical half coarsely punctured, but the punctures not so coarse as to render the sculpture rough and obscure; the closely sculptured area wider than long, not bearing a pair of tubercles and apically not dentate, not bearing hypopygial teeth, with long, silvery pilose hairs.

Holotype: Tyler, Texas, September 1, 1937 (Christenson 3753), in collection of United States Museum.

This new species is easily recognized by the dense, white and ivory white pubescence of the head (neither glittering silvery as in *argenticeps*, nor golden yellow as in the related *auricapitis*). The sericeous pubescent maculation of the propodeum, and of the midline of the apical abdominal tergites, as well as the size of the maculae of the disk of the second tergite recall the closely related *auricapitis*. As in the latter, there is quite distinct development of the delicate undulate carinules connecting the genal tubercles and the occipital ridge; however, the hypopygium is not quadridentate apically. The relationship of the two species is exceedingly close, and the similar degree of coarseness and closeness of puncturation, as well as entire facies suggests that perhaps the specific differentiation I draw between them is not valid.

***Ephuta auricapitis* sp. n.**

FEMALE. Length 4.5 mm. Integument of head testaceo-ferruginous, the alitrunk and abdomen deep ferruginous, antennae and legs testaceo-ferruginous to yellowish, paler than body. Head conspicuously, densely appressed golden yellow pubescent on front and vertex. Propodeum with indefinite median and dorsolateral lines of silvery decumbent, sericeous hairs. Second abdominal tergite with large, conspicuous maculae of silvery, decumbent, sericeous hairs. Tergites 3-5 fuscous erect pubescent, except for a vague

median longitudinal line of sparse, silvery, sericeous decumbent hairs. Pygidial area defined, the defined region nitid and smooth; hypopygium quadridentate distally, not perceptibly tuberculate basally.

Head testaceo-ferruginous, transversely oval, wider than alitrunk. Supraclypeal ridge obtusely angulate, equally quadridentate. Front and vertex closely, moderately coarsely, deeply punctured, the narrow to vestigial intervals closely setigerously punctulate (giving rise to the decumbent conspicuous vestiture); genae similarly punctured and punctulate; front and vertex with dense, decumbent, sericeous, brilliant golden yellow vestiture, and with a sparse vestiture of rather short-clipped, similarly pigmented, erect hairs (shorter than the row of erect, slender, setose fuscous hairs margining the eyes); the genae with sparse, erect, and rather sparse decumbent silvery vestiture. Eyes large, silvery, asymmetrically ovate; their minimum frontal distance apart equal to 1.15 the eye-length; distance between lower corners of eyes and apex of posterior mandibular condyles 0.4 the eye-length. Antennae testaceous, the first flagellar segment strongly transverse (1.5 as wide at apex as long), about 1.1-1.2 as long as the much narrower pedicel, virtually equal in length to the second flagellar segment. From the posterior mandibular condyles a pair of high, sharp carinae run backward and obliquely mesad, soon terminating in a sharply, angulate, erect tubercle on each side; from these tubercles or teeth run back a pair of sinuous, delicate low carinules (obsolete for a short distance a little above the teeth), that at first gently converge, then diverge, finally ending in the ventro-lateral portions of the occipital ridge.

Alitrunk in general shape in dorsal outline rather narrow ovate, but somewhat wider anteriorly (thus slightly obovate), deeply ferruginous throughout. Dorsal surface and pleura very uniformly contiguously or closely, regularly punctured, the punctures rather coarse, round, deep, sharply defined, similar in size to those of genae. Pleura and propodeum with sparse, erect, and suberect, rather long, white hairs; the dorsum of pronotum, mesonotum, and metanotum with similar, fuscous hairs; lateral pronotal faces, in addition, with rather conspicuous appressed, sericeous, glittering white hairs, and the propodeum with three, vague, ill-defined, similar bands of hairs; one median, the others one on each side at juncture of dorsal and lateral propodeal faces. Legs yellow or testaceo-ferruginous, with sparse, white vestiture.

Gaster deep ferruginous, nearly uniformly so. Petiole with normal transverse band of decumbent sericeous white hairs; ventrally with a median, short, longitudinal high ridge, slightly higher anteriorly, but not dentate. Second tergite with punctures about as coarse as on alitrunk, but even closer, more elongate, the transverse intervals vestigial (the punctures thus more or less confluent in longitudinal rows); disk and a narrow median apical interruption with sparse, moderately long, decumbent and suberect fuscous black hairs, arising from the coarse punctures; marginal portions of tergite with similar, white hairs; base of disk in addition, with a conspicuous pair of maculae formed by decumbent, fine, sericeous, glittering pale hairs, and the apex of disk with a similar broad band of hairs (medially interrupted, but otherwise subequally wide, except for lateral

anterior extensions). Second sternite very coarsely, contiguously, deeply punctured, with sparse, white vestiture. Tergites 3-5 finely, inconspicuously punctulate, with rather sparse and long, suberect to erect fuscous hair (except for a narrow, vague, median line of decumbent and appressed, silvery, sparse, sericeous hairs). Pygidium with virtually entirely pale hairs, with a median, nitid, glabrous region, which, on the posterior fourth of the segment is defined by a pair of delicate, arcuate, converging carinules (thus delimiting a rather broad and short, nitid and impunctate pygidial area). Hypopygium with a distal, coarsely, contiguously punctured area, wider at base than long, entirely lacking all trace of the basal tubercles or transverse ridge; the apex clearly quadridentate.

Holotype: Edinburg, Texas (Stanley Mulaik), in collection of University of Minnesota.

This distinctive species occupies an intermediate position between the *sudatrix* complex and the *baboquivari* complex. In the very densely golden pubescent head, the prominent maculae of the second abdominal tergite, and the undulate, delicate, but complete carinules running up from the hypostomal tubercles to the occipital carina, the species resembles *sudatrix* and its allies. It differs from those at once by the relatively broad, distinctly defined pygidial area of the last tergite, and by the pubescent-maculate propodeum (which bears three obscure stripes of silvery decumbent hairs). In this species the eyes are slightly smaller (their frontal distance apart about 1.15 their length), while in the *sudatrix* complex they are larger (their frontal distance apart varying from 0.98-1.07 their length). In the combination of maculate second tergite, sericeous pubescent head, and defined pygidium, the species agrees with the *albiceps* (*baboquivari*) complex, with which it further agrees in the complete hypostomal-postgenal carinules. The relatively large maculae of the second tergite ally it to *albiceps*. It differs from the latter in the golden pigmentation of the vestiture of the head and in the quadridentate hypopygium.

The golden vestiture of the head separates the species from all the species of the *baboquivari* complex, except for *baboquivari* itself. It differs from the superficially similar appearing *baboquivari* as follows: the propodeum trilineate; maculae of second tergite large; hypopygium not distinctly armed at base (distinctly transversely carinate in *baboquivari*); eyes larger, their frontal distance apart only 1.15 their length (1.2-1.3 in *baboquivari*); distal tergites with a narrow median line of silvery hairs.

Ephuta baboquivari sp. n. (Figs. 39, 41).

FEMALE. Length 3.9 mm. Uniformly ferruginous, with unusually fine and regular puncturations. Head with large silvery eyes and a conspicuous dorsal vestiture of glittering yellowish sericeous hairs; hypostomal-subgenal carinules complete, distinctly arcuate and quite sharp and glabrous throughout their length. Abdomen with the discal maculae of the second tergite quite lacking; distal segments largely to nearly entirely fuscous pubescent; pygidium defined, glabrous and nitid; hypopygium with a distinct basal transverse carina, the apex not quadridentate, entire.

Head rufo-ferruginous, transversely oval-obtrapezoidal, 0.87 mm. wide; eyes 0.44 mm. long and 0.35 mm. wide, large and silvery; front 0.53 mm. wide (1.20 the eye-length); malar length 0.24 mm. (the eye-length 1.83 the malar distance). Front closely and contiguously, moderately and rather hexagonally punctate, the punctures giving rise to stiff, long, sparse, erect golden-brown or fuscous hairs, and with thin sericeous curly decumbent golden yellow hairs; vertex with close but scarcely contiguous, round punctures, giving rise to suberect yellowish hairs, and with interspersed punctulations, giving rise to decumbent, curly sericeous glittering yellowish hairs, sufficiently dense to obscure the sculpture; genae closely punctured, the intervals punctulate and giving rise to a thin whitish sericeous vestiture. Hypostomal-subgenal carinules complete and obvious, the ventral, oblique portions bordering the oral region ending in triangular moderate teeth, from which run back undulate carinules ending in the margin of the occipital ridge; the area mesad of the carinules nitid and impunctate, and a narrow strip laterad of the carinules similarly nitid and impunctate. Antennae with distal parts of flagellum darker and subfuscous, the basal part testaceo-ferruginous; pedicel 0.07 mm. long; first flagellar segment 0.093 mm. long and 0.12 mm. wide; second flagellar segment 0.085 mm. long and 0.125 mm. wide.

Alitrunk 1.17 mm. long, 0.74 mm. wide at the apices of the pronotal spiracular plates, 0.76 mm. wide at the apices of the propodeal spiracles, with the distance between front and rear spiracles 0.39 mm. Integument ferruginous throughout; puncturation fine, very regular, close and contiguous to subconfluent; vestiture sparse, on meso-metanotal region and posterior part of pronotum fuscous, elsewhere white or silvery; pronotum lacking conspicuous silvery sericeous vestiture on the lateral faces; propodeum with inconspicuous silvery sericeous vestiture, not distributed in vague lines, the lateral angles scarcely more densely pubescent. Legs rufo-testaceous at base, the tibiae at least somewhat subfuscous distally.

Gaster nearly uniformly ferruginous. Petiole with ventral carina low posteriorly, dentiformly produced anteriorly, second tergite with unusually fine and regular, close and contiguous, occasionally subconfluent puncturation on the disk, the punctures ca. 0.04 mm. in diameter, becoming slightly more distant laterally; vestiture of disk all fuscous, stiff, suberect or slightly decumbent, with no trace of sericeous discal maculae; apex of tergite with a distinct, equally wide band of silvery sericeous hairs, interrupted medially by fuscous hairs; with thin scattered sericeous silvery hairs bordering the lateral edges of the tergite. Second sternite with

coarser, more irregular, close to confluent puncturation. Tergites three to five entirely fuscous, erect, and suberect pubescent, except the extreme lateral margins which bear whitish hairs. Sternites three to six sparsely silvery pubescent. Pygidium with a well-defined area 0.11 mm. wide (0.25 the width of the last tergite), the area very obscurely and finely granulose-punctate, appearing smooth at moderate magnifications. Hypopygium basally with a transverse glabrous, rounded ridge connecting the lateral tubercles; apex appearing entire.

Holotype: Baboquivari Mountains, Arizona, in collection of Cornell University.

This species is the only member of the *baboquivari* complex in which the head is brilliant golden yellow pubescent. In this feature it approaches *auricapitis*, of the *albiceps* complex. In the relatively large eyes (with the front only 1.2 the eye-length) it also approaches the *albiceps* complex and differs from the other members of the *baboquivari* complex. The total absence of maculae of the second tergite, and the transversely carinate base of the hypopygium will at once separate it from the *albiceps* complex; furthermore, the uniformly sparse vestiture of the propodeum is a feature not found in *albiceps* and its allies.

Within the *baboquivari* complex the species is most closely similar, superficially, to *E. floridana dietrichi*: it differs from the latter as follows: the eyes are larger; the puncturation is much finer, smaller and more regular; the sericeous vestiture of the head is more brilliant; the hypostomal-postgenal carinules are complete and sharply indicated. The absence of maculae of the second tergite, and the moderately developed vestiture of the head, as well as the presence of a transverse hypopygial ridge appear to ally the two species. The species is also clearly related to *argenticeps*: it shares with the latter the complete carinules of the under side of the head, the brilliancy of vestiture of the head, and the distinct transverse ridge of the hypopygium. However, the silvery color of the vestiture of the head, the bimaculate disk of the second tergite, the smaller eyes, and the coarser sculpture will separate *argenticeps* from *baboquivari*.

Ephuta yucatanana (Blake) (comb. nova)

1871 *Mutilla yucatanana* Blake, Trans. Amer. Ent. Soc. 3: 231, female (Mexico)

I have carefully studied the type of this species (Type 4588, in collection of Academy of Natural Sciences, Philadelphia),

since from its description it could not be separated from *puteola* (described eight years later by Blake). Blake describes the head as "thinly clothed with erect black hairs." This would put the species in the *puteola* complex. Careful study reveals the presence, in addition to the erect, sparse fuscous hairs, of a rather thin, sparse vestiture of silvery, sericeous, decumbent hairs. Their presence immediately separates the species from *puteola* and its relatives.

The species is most closely allied to *baboquivari*, sp. n., with which it shares the following critical characteristics: the interrupted band of silvery sericeous hairs of the apex of abdominal segment two is subequally wide throughout; the alitrunk, head, and second abdominal tergum bear very fine, dense, contiguous regular puncturation; the head bears a distinct (if rather inconspicuous vestiture) of brilliant, sericeous hairs; the disk of abdominal tergum two lacks all trace of sericeous pubescent maculae; the head has the subgenal-hypostomal carinules sharp and complete throughout; the eyes are rather large and prominent.

The species differs at once from *baboquivari* (which has a very dense golden decumbent vestiture of the head) in the relatively sparse vestiture of the head, the decumbent sericeous portion of which is silvery on the front and vertex, becoming fuscous (like the erect hairs) on the posterior portion of the vertex. I had no opportunity to compare the two types, hence was unable to check for other differences.

The species is Mexican and known only from the type. It is included here because it may eventually be found northward across our borders, and because the original description is quite meaningless and misleading. In the relatively sparse sericeous vestiture (arising from puncturations scattered among the coarser cephalic punctures), which is relatively dull, at least on the vertex, the species approaches *E. floridana dietrichi*. It differs from the latter at once in the sharp, complete, carinules separating the genae from the postgenae.

FEMALES NOT CORRELATED WITH ANY SPECIES OF MALES
TUMACACORI COMPLEX

The solitary included species is very distantly related to any other North American species of *Ephuta*. It is barely possible that it may be the female of *E. rufisquamis* André.

The following characters diagnose the group: the very curiously armed hypopygium, with a distinct elevated V-shaped process; the well-developed, dorsally expanded subgenal-hypostomal carinules; the very large size; the setigerously punctured pygidial area; the dense bands of silvery hairs of the distal abdominal tergites, interrupted by a median patch of fuscous hairs. These characteristics all give the species a very unique appearance. In the silvery pubescent head and distinctly bimaculate disk of the second abdominal tergite the species resembles the *albiceps* and *sudatrix* complexes, and it is probably most closely related to these.

Ephuta tumacacori sp. n.

FEMALE. Length 9.0-9.5 mm. Integument ferruginous throughout; head with dense, pale golden decumbent and erect vestiture; propodeum trilineate with weak fasciae of white, sericeous hairs; second abdominal tergite bimaculate on anterior part of disk with a pair of rather large, prominent maculae of pale, decumbent and appressed, sericeous hairs; tergites 2-5 with broad, prominent, dense apical bands of white sericeous, appressed, curly hairs, interrupted medially by fuscous and brownish hairs, the interruptions becoming progressively more narrow from segment two to segment five; pygidium with a defined, closely, setigerously punctured median region, obscured by a median fascia of decumbent, long, dense white hairs; hypopygium distally distinctly quadridentate, near base with two glabrous tubercles, one on each side, and on disk with a characteristic V-shaped biramose elevation, the arms of the V converging, and meeting along midline, posteriorly, before apex of hypopygium, the arms distinctly elevated, forming glabrous ridges.

Head transversely oval, subparallel for a short distance behind eyes, the integument ferruginous throughout. Front and vertex with rather coarse, dense, contiguous to confluent puncturation; genae similarly punctured, if anything, less closely so; intervals densely setigerously punctulate, bearing a dense, conspicuous vestiture of pale golden to ivory colored hairs on front and vertex, and a sparser, pale vestiture on the genae; in addition there is a sparse erect and suberect vestiture of rather short-clipped, stiff hairs, ivory white to pale yellowish in color on front and vertex, white on the genae. Supraclypeal flange weakly arcuate, rather strongly downward produced and arcuate, sharply quadridentate, the teeth acute, rake-like. Eyes moderately large, 1.11 mm. long, 0.68 mm. wide, their distance apart on front 1.30 mm. (1.17 eye-length); distance between lower eye-margins and apex of ventral mandibular condyle 0.58 mm. Antennae with pedicel 0.16 mm. long, first flagellar segment distinctly elongate, obconical-truncate, 0.29 mm. long, 0.23 mm. wide at apex; second flagellar segment 0.22 mm. long on outer (longest) face, 0.25 mm. wide. Genal ridges running back and mesad from posterior mandibular condyles high, sharp, ending in a prominent, angular spinose tooth on each side; the genal-postgenal ridges

running up from these well developed, at first slightly convergent, then gently flaring outward, ending above in the occipital ridge, and distinctly dilated before attaining the occipital ridge, forming a hyaline, lamellate process on each side; occipital ridge shaply carinate, acute, above and laterally, ventrally merely an acute fold. Head 2.35 mm. wide.

Alitrunk ferruginous throughout, rather narrowly obovate, widest in mesothoracic region and considerably narrowed behind, 3.04 mm. long, 1.98 mm. wide at prothoracic spiracular tubercles, 1.76 mm. wide between apices of the tubereuliform produced propodeal spiracles; the distance between anterior and posterior spiracles 1.03 mm. Punctuation very uniform throughout on dorsum and pleura, only moderately coarse, but very dense, sharply defined, the punctures deep, contiguous. Vestiture sparse, stiff, erect and suberect, not shaggy, stained yellow on notum but white laterally; pronotum, especially on side, with some fine, curly, sericeous white hairs as well, and the rest of the pleura with similar vestiture scattered over the surface; propodeum with distinct dorso-lateral stripes of white sericeous hairs, and a short dorsomedian stripe of similar hairs, between which the integument is dark ferruginous. Legs concolorous with body, with rather short, yellowish-stained vestiture.

Gaster ferruginous throughout. Petiole transverse, dorsally with a dense transverse band of fine, sericeous white hairs. Second tergite punctured as coarsely as alitrunk, but more closely so, the punctures contiguo-confluent, sharp, deep, the occasionally vestigial intervals sharp and thin; vestiture erect, or suberect, sparse, stiff, fuscous on disk and whitish on lateral, basal and apical margins; in addition, the disk near the base bears a pair of conspicuous maculae formed by pale, sericeous hairs, and the apex bears a wide border of similar hairs (interrupted medially by a fuscous band about as wide as the distance between the maculae); tergites 3-5 with similar broad, apical, pale, sericeous bands, with the median interruption progressively narrower, poorly developed on tergite five, the lateral margins of tergites 3-5 with some fuscous hairs as well. Sternite two extremely coarsely punctured, rather irregularly and rugosely sculptured, near apex somewhat strangulate, the portion distad of the strangulation less coarsely sculptured; vestiture white, sparse. Pygidium laterally fuscous pubescent, dorsally whitish pubescent, the hairs dense, rather long and shaggy; the vestiture erect or suberect, except for a median, pale stripe of decumbent hairs, that completely obscure the pygidium; a distinct pygidial area present, 0.33 mm. wide, closely setigerously punctured, except at extreme apex. Hypopygium sharply quadridentate at apex, the distal teeth on each side forming a channel for the sting, the lateral teeth forming small, erect processes clasping the sides of the pygidium; disk of hypopygium closely, coarsely sculptured and hirsute, except for a pair of basal glabrous, sub-lateral tubercles, not connected by a transverse ridge, and a V-shaped, high, biramose process, highest posteriorly, where it ends in a sharp, elevated point, shortly before the apex of the segment.

Holotype: Tumacacori Mountains, Arizona, September 1, 1931 (I. Wilson) in collection of R. M. Bohart.

This interesting, distinctive new species is not closely allied to any other species occurring in America north of Mexico. I have been unable to determine its affinity to the neotropical species, since the descriptions of the earlier writers, particularly of Cameron, are unreliable or incomplete, as regards significant characteristics. The punctate and appressed-hirsute pygidial area, clearly laterally defined, is at once diagnostic of this species. Because of the golden pubescent head and the pair of maculae of the anterior portions of the disk of the second tergite, this species bears a certain superficial resemblance to such species as *E. sudatrix* and *E. baboquivari*. The pubescent pygidium, as well as the characteristic dense bands of sericeous white hairs on abdominal tergites 3-5 (entirely similar to that of the apex of tergite two) at once distinguishes the present species from these forms. Structurally as well as in the superficial characters of pigmentation and sculpture, the species diverges widely from the other species of *Ephuta* known from our area. In the lamellate expansion of the upper portions of the postgenal ridges the species differs from all our other forms; in the very characteristic biramose, acutely V-shaped elevated process of the disk of the hypopygium the species is also very distinct from the other nearctic species. In addition, the sharply, coarsely dentate, transverse, arcuate supraclypeal ridge is different in appearance from that of the other species. The species is also much larger and more massive than our other known forms.

(Continued from page 6)

members and five guests present. The following were proposed for membership in the Society: Miss Mary John, Mr. Andrew Turchinsky, Mr. Francis Costello and Mr. Mathew E. Turner.

President Vishniac outlined the program for the remainder of the year. The Secretary reviewed the work done during the past summer in the matter of the sorting and proper housing of publications of the Society. Assisting the Secretary were Drs. Clausen and Forbes and Mr. Huberman. The Secretary called attention of the members to certain entomological works that are available at very low prices.

As this was the first meeting of the fall session various members spoke about their summer experiences. Dr. Ruckes reviewed his work on the Hemiptera collection of the American Museum, the integration of the extensive Olsen collection of Homoptera (about 10,000 specimens) into that of the Museum, the rearrangement of the Heteroptera from South America

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